

ECONOMICS

B.Com (Part-I)

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A TEXT BOOK OF

ECONOMICS

FOR

B.COM PART-I

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PREFACE

The amount of knowledge in the world had been doubled every 10 years in last century, and in the turn of twenty-first century, it will be doubling every 5 years. If you plan to be a professional manager perhaps a skilful economist–this knowledge explosion means you will be faced with unprecedented challenges and opportunities. How will you address them will depend in large part on your ability to adapt to continuing change and your previous knowledge. We think some of the knowledge you'll need is contained in this book.

Some appreciation of what lies ahead can be gained by examining recent developments. Consider how our lives have been altered by personal computers that know have memories greater than the main frames only a few years ago, facsimile machines that transmit documents around the world in seconds, and fiber optics that improve both the quality and cost effectiveness of communications across great distances. Our personal lives and business world have also been affected by breakthroughs in fuel technology and production processes; likewise, improvements in production processes will influence the goods and services purchased by individuals and organizations.

In response to or perhaps in anticipation of these developments, economists will have to learn to maximize the consumer satisfaction and to make decisions more and more quickly. For instance, they will have detailed information of their current and prospective economic issues. Economics will be able to quickly determine the policies and procedures to increase the National Income for the next years. To survive-better yet, to prosper-in economy, you must have a contemporary understanding of this dynamic world, including the field of Economics. It is hope that this book will prove of great assistance both to the teachers and students.

Suggestion for the improvement of the book a cordially invited and will be favourably considered at the time of the publication of its next edition.

AUTHORS

Budget line,

Curve show combination of two goods X and Y that a consumer can purchase in a given level of income and prices.

Classical
Ne. Classical
Robbins

DEDICATED

To Our Parents

SYLLABUS

ECONOMICS

Consumption: *Definition, Nature, Scope and Importance (Micro and Macro) Economics Description, Analysis and Policy: Economic Methodology.*

Consumption: *Definition and meaning, Diminishing Marginal Utility, Consumer's Surplus, Law of Substitution; Indifference Curves, Consumer's Equilibrium with Indifference Curves, Price and Income effect.*

Demand & Supply: *Definition and meaning, Curves; Elasticity of Demand and its measurement.*

Income and Cross Elasticity. Supply, Changes in supply. Elasticity of Supply, Market Equilibrium Analysis.

Production: *Law of variable proportions. Factors of Production, Land, Labour and its mobility, capital, it meaning, accumulation of capital, productivity of Capital, Entrepreneur, Functions of Entrepreneur.*

Costs of Production: *Fixed, Variable, Total, Average and Marginal; Costs over time period, Derivation of short and long run cost cures.*

Market: *Perfect and Imperfect Competition, Demand and Supply Relationship. Market Price determination under Perfect Competition, Monopoly and Monopolistic Competition, Oligopoly, Duopoly (Basic Concepts).*

Factor Pricing: *Rent, Wages, interest and Profit.*

National Income: *Measurement of National Income, Concepts of National Income-GNP, National Income at market price, at factor Cost; Measurement of National Product in current price and in constant prices.*

Public Finance: *Meaning, Difference between Private and Public Finance, Kinds of Taxes and Cannons of Taxation.*

Economics in Islam: *Economic role of State in Islam, Zakat and Usher.*

Mathematical Economics: *Differentiation of functions. Partial differentiation. Application of derivatives in Business/Commerce, Optimization (Maximization and Minimization)*

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Cost —
Demand Supply.
Revenue.
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MICRO ECONOMIC ENVIRONMENT

CHAPTER 1

NATURE AND SCOPE OF ECONOMICS

INTRODUCTION

A prominent economist L.M. Fraser has classified the definition of Economics into type A and type B. Type 'A' definitions are related to wealth and material welfare and type 'B' to the scarcity of means or resources or wealth.

1. WEALTH AND WELFARE DEFINITIONS

The classical economist Adam Smith defined economics as the science of wealth. Among his followers J.B. Say defined economics as "the study of the laws which govern wealth. F.A Walker defined as "Economics is that body of knowledge which relates to wealth". J.E Cairnes with J.S. Mill and N.W. Senior defined economics as "Political Economy is a science ...... it deals with the phenomena of wealth".

The Neo Classical Economists lead by Prof. Alfred Marshal gave economics a respectable place. He laid emphasis on man and his welfare and wealth was regarded as a source of human welfare, not an end in itself but a means to an end. According to Alfred Marshall "Political Economy or Economics is a study of mankind in the ordinary business of life; it examines that part of individual and social action which is most closely connected with the attainment and with the use of material requisites of well being. Thus it is on the one side a study of wealth; and on the other and more important side, a part of the study of man".

2. SCARCITY DEFINING

It was Prof. Lord Robbins who with the publication of his "Nature and significance of Economic science in 1932 not only revealed the logical inconsistencies and inadequacies of the earlier definitions but also formulated his own conception of Economics. In the word of Robbins; "Economics is the science which studies human behaviour as a relationship between ends and scarce means which have alternative uses".

DEFINITIONS OF ECONOMICS WITH THEIR MERITS AND DEMERITS

ADAM-SMITH .... SCIENCE OF WEALTH

DEFINING ECONOMICS

The classical Economists under the leadership of Prof. Adam Smith defined Economics as science of wealth. Adam Smith in his research paper explained the concept of Economics under the heading.

"An Enquiry into the nature and causes of wealth of nations".

He explained the concepts and principles governing consumption production, distribution and exchange of wealth. Among his followers J.B. Say defined economics as "the study of the laws which govern wealth".

The main drawback in the definitions of economics had been the undue emphasis on wealth-producing activities. Wealth was considered to be the end in self. The most two prominent religious reformers named: "Ruskin and Carlyle criticised the concept of wealth and called economics as a dismal science which teaches selfishness.

MARSHALLIAN DEFINITION .... SCIENCE OF MATERIAL WELFARE

After criticism on Adam Smith's views of economics Prof. Alfred Marshall defined economics as:

> ***Political Economy or "Economics is a study of mankind in the ordinary business of life. It examines that part of individual and with the social action which is most closely connected with the attainment and with the use of material requisites of well-being".***

Thus it is on one side a study of wealth and on the other and more important side, "a part of the study of man i.e., human welfare".

We may conclude from the above definition:

1. Economics is a study of mankind in the ordinary business of life.
2. Economics is a social science because it examines individual and the social action.
3. The subject matter of economics is the attainment and the use of material requisites of well-being, i.e., material welfare.
4. Economics is a study of both wealth and material welfare but more important is the material welfare.

MERITS OF MARSHALL'S DEFINITION OF ECONOMICS

1. Economics is a Social Science

According to Marshall, "Economics examines individual and social action" i.e., in economics we study that person who is living in a society and is passing an ordinary life i.e., where people help each other, co-operate each other and influence each other.

2. Subject Matter of Economics

If a definition does not explain the subject matter it cannot be called a proper definition. Therefore, the definition of economics is superior because it explains the subject matter. The subject matter of economics according to the definition is "the attainment and the use of material requisites of well being" (i.e., material welfare).

3. Science of Human Welfare

According to Marshall, the aim and object of economics is the study of Wealth on the one side and the more important side is the study of human welfare. According to him economics is a social science so it must possess the concept of material welfare.

4. It Corresponds to Modern Economica Theories

The most modern Economic theories are the Economic Planning and Economic Development. The object and goal of Economic planning is the human material welfare and economic development is nothing but "The process whereby country's real per capita income and national income increases over a long period of time". i.e., material welfare of the people. Marshall also views that the objective of the subject is material welfare.

5. Wealth for Welfare

We can derive from Marshallian definition that economics is not only the study of wealth (as stated by Adam Smith) but also the study of man. i.e., Marshall believes in the concepts of consumption, production, distribution and exchange but the goal of economic activity must be material welfare.

DEMERITS OF MARSHALL'S DEFINITION OF ECONOMICS

The definition of Economics given by Marshall has been criticised by Sir Lynol Lord Robbins on the following grounds:

1. It does not cover all Economic Problems

According to Marshall, in Economics we study only those persons living in the society and their efforts are for material requisites only. It ignores all other persons who may be facing economic problem but may not be passing ordinary life.

2. Classification

Robbins criticised the definition being classified by Alfred Marshall i.e., we shall study the efforts of those persons who are living in the society and their efforts are for material requisites of well being only. i.e., he has drawn a line of distinction between social and unsocial and material and non-material requisites of well being.

3. Material and Non-Material

According to the definition "economics examines that part of individual and social action which is most closely connected with the attainment and with the use of material requisites of well-being" thus Marshall has confined himself to the study of material welfare while in the actual study of economic principles, both the "Material" and "Non-Material" are taken into account.

4. Vague Concept of Welfare

The subject matter of Marshall's definition is the material welfare. Welfare is a mental phenomenon and the concept of welfare varies from person to person, age to age, place to place and country to country. Welfare is vague and indefinite and the whole building of economics can not be constructed on this foundation.

5. Factors Decreasing Welfare

Robbins criticised both material and welfare. According to him it is not necessary that all that is wealth adds welfare e.g., intoxicants are regarded as wealth (having value) but by no means they are conducive to human welfare.

6. Restricted the Scope of Economics

By studying a social man and material requisites of well-being only. Marshall has restricted the scope of Economics.

7. Ignored Services

There are several goods which are highly conducive to human welfare, but which have nothing material in them e.g., services of teachers, doctors, engineers and lawyers etc. Their services have economic significance. The services are scarce and have value. Thus, economics is concerned with both material and non-material things provided they have value.

8. Causes of Material Welfare

According to Robbins, Economics is not to be regarded as study of the causes of material welfare. "Whatever economics is concerned with, it is not concerned with the causes of material welfare as such".

Robbins in his book "Nature and Significance of Economic Science", written in 1932 defined economics as "Economics is the Science which studies human behaviour as a relationship between ends (wants) and scarce means which have alternative uses".

The definition is based on the following facts:

(a) The wants are unlimited.

(b) These unlimited wants are not economically equal. Their importance varies. Some wants are more important and some are less important.

(c) The means to satisfy these unlimited wants are scarce.

(d) The scarce means are capable of alternative uses.

MERITS

The merits of Robbins's definition are the following:

1. Explanatory and Based on Facts

Robbins definition of economics is based on facts of life. Everyone of us knows that our wants are unlimited and the means to satisfy these wants are scarce. The unlimited wants are of varying importance and scarce means have alternative uses.

2. Scientific View

Robbins definition is impartial between goodness or badness of wants. It is more scientific, since it rejects the artificial classification of wants as material and non-material and person living in the society or not living in the society. It only discusses the economic problems arising due to multiplicity of wants and scarcity of means and who so ever is facing economic problem comes under the study of economics.

3. Widened the Scope of Economics

Robbins definition takes into account all types of persons whether living in the society or not and all types of wants whether material or non-material. The only condition is that there is economic problem.

4. Subject Matter of Economics

Robbins definition is based on two foundation-stones viz., multiplicity of wants and scarcity of means i.e., the economic problem. That is only those problems will be discussed in economics which arise due to unlimited wants and scarcity of means.

5. A Positive Science

The subject economics before Robbins regarded as both science and art. They regarded it a normative science. Robbins not only raised economics to the level of science but also made it positive science. In positive science facts collected regarding any branch of life are stated and explained as they are.

6. Analytical View

Robbins while defining economics has adopted analytical view i.e., he has only analysed the facts and has not given his own views i.e., he does not believe on classification of facts.

DEMERITS

Robbins definition of economics has been criticised on the following grounds:

1. Economics is not a Positive Science

Robbins has made economics an impartial science. But all other positive sciences deal with matter which acts and reacts according to the laws of nature while economics deals with human beings who have their own attitudes and sentiments and not bound to predetermined principles.

2. No Touch of Human Welfare

Robbins made economics as a positive science and therefore, tried to prove that economics has no relation with human welfare because positive science deals with matter. But economics is a social science and like all other social sciences the object of economics is human welfare.

3. It does not Correspond to Modern Economic Theories

In the present world economic theories like economic planning, economic growth and economic development have become very important branches of economics. All the major economic problems like low per capita income, low level of national income, unemployment, disequilibrium in balance of payments, unequal distribution of wealth can only be solved with the help of economic planning. But in economic planning we have to make choices among the objectives and allocation of resources to more useful projects and according to Economic development and economic growth we explain how economy develops and grows and the factors which bring about increase in national income, per capita income, production capacity and efficiency of labour and capital of the economy. Robbins take the resources given and only discuss their allocation.

4. Does not cover all Economic Problems

According to Robbins definition of economics only those economic problems can be studied which arise due to multiplicity of wants and scarcity of means. But there are some economic problems which arise due to multiple means and scarce wants e.g. unemployment and over capital. Unemployment is a result of excess of labour force (i.e., means) than the availability of jobs (i.e., wants). Japan is facing the problem of over capital and even its freedom and security is in danger.

5. Only a Valuation Theory

Another objection on Robbins's definition is that he has made economics merely a valuation theory and the other important aspects of study of economics have been relegated to the background

6. Ignores Macro Aspect

The definition has been criticised on the ground that it only studies the micro aspects and ignores the macro aspects like National income, Employment, Balance of trade, unequal distribution of wealth and inflation etc.

7. Colourless and Neutral

Robbins definition of economics is although scientific yet impersonal colourless and neutral between ends. According to Prof. Thomas "The function of the economist is not only to explain the causes, but to advocate the possible right opinion on the matter".

8. No Normative Aspect

The definition has been rejected on the grounds that normative aspect has been totally neglected. According to Wooton, "the normative aspect can not be absolutely neglected". Economics can be proved useful only when the normative aspects are retained.

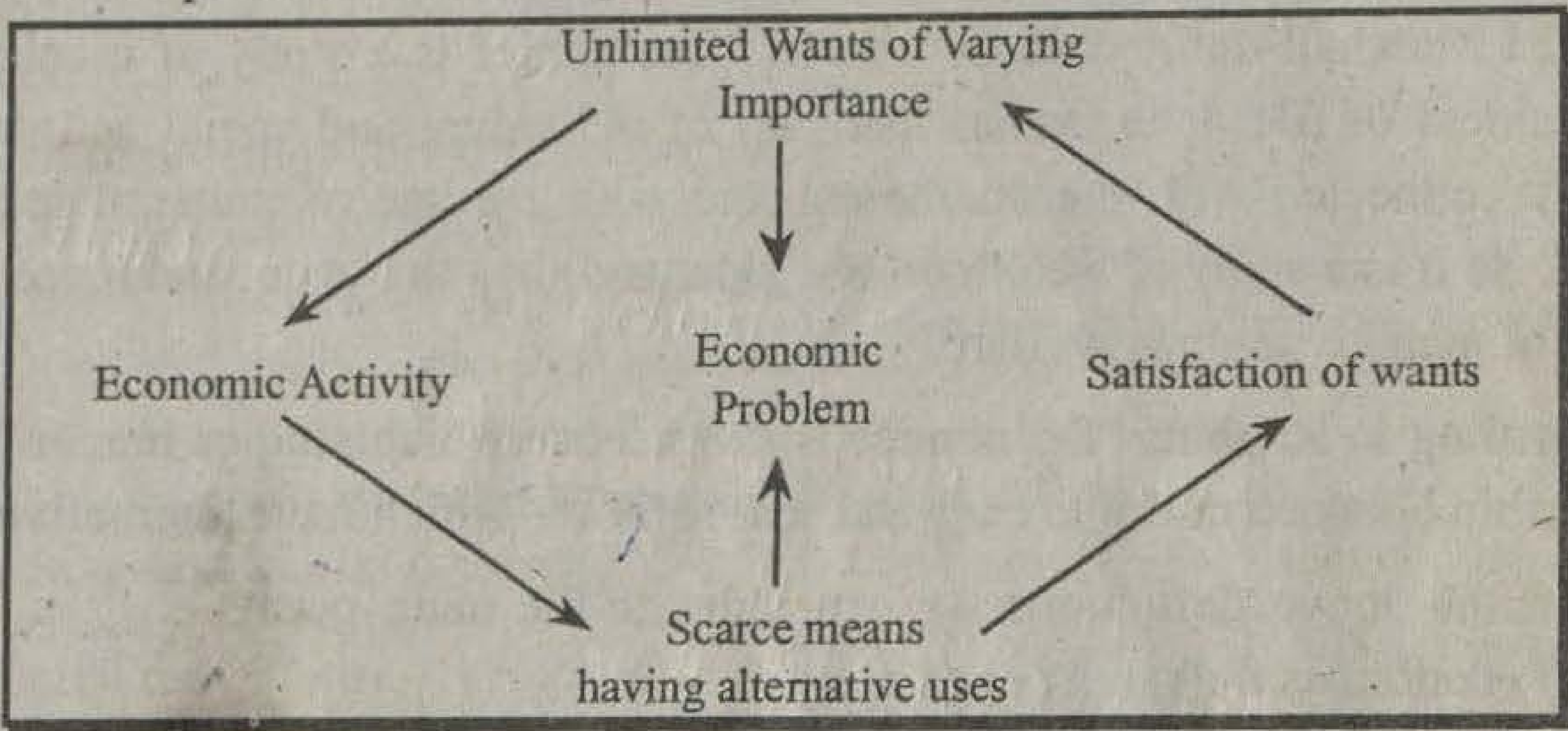
ECONOMIC PROBLEM

According to Robbins

> ***"Economics is the science which studies human behaviour as a relationship between multiple wants and scarce means (resources) which have alternative uses".***

1. Human wants are unlimited because these appear and reappear.
2. All the human wants are not economically equal. Some wants are more important and some are less important and, therefore, compete each other.
3. The means or resources to satisfy the unlimited wants are scarce.
4. These scarce means have alternative uses.

Economic problem can be explained with the help of a following model.



It is clear from the above model that to satisfy unlimited wants which are of varying importance we start economic activity and as a result of this economic activity we are getting scarce means, wealth or resources. With these scarce means we try to satisfy unlimited wants but wants are appearing and reappearing therefore, we reach again on a point of unlimited wants and we are facing with economic problem. Therefore, we make a choice between unlimited wants and scarce means.

According to Robbins if the above four conditions combine together economic problem arises i.e., wants are unlimited, their importance varies, the resources to satisfy unlimited wants are scarce and have alternative uses.

If any one of the above mentioned four conditions is absent economic problem does not arise e.g., if the wants are limited and countable then the limited wants can be satisfied with scarce means and once these limited wants are satisfied no economic problem will arise because there will be no need for economic activity.

Secondly, if the wants are unlimited but their importance does not vary even then, there will be no economic problem because we need not to decide which want should be satisfied first and which later on, we shall go on satisfying wants without any problem. For example: if to purchase a shirt and a Necktie is of equal importance there is no need to think, which is to be purchased first.

Thirdly, if the means to satisfy the unlimited wants are not scarce but are also unlimited then there will be no economic problem. Because unlimited wants will be satisfied with unlimited means, e.g., if our wants are of Rs. 50,000 and the means at our disposal are either equal to Rs. 50,000 or more, then there is nothing to be worried about because we can easily satisfy our wants with the means.

Fourthly, if scarce means have no alternative uses and one mean can satisfy only one want there will be no economic problem because we need not to think e.g., if we can only make doors with wood and nothing else then there is no need to think and hence, there will be no economic problem.

COMPARATIVE STUDY OF THE DEFINITIONS OF ECONOMICS

Alfred Marshall defined economics as "Economics is a study of mankind in the ordinary business of life. It examines that part of individual and social action which is most closely connected with the attainment and with the use of material requisites of well-being". So it is a study of wealth on one side, and the other side, and more important is the study of man i.e., human welfare.

According to Robbins "Economics is the science which studies human behaviour as a relationship between multiple ends and scarce means which have alternative uses".

From the above definitions we can indicate the main points e.g., in Marshall's definition of economics the main points are:

(i) Study of mankind in the ordinary business of life.

(ii) Economics is a social science.

(iii) It is a science of material human welfare.

(iv) Study of wealth for the study of human welfare.

In Robbins definition of economics the main points are:

(i) Unlimited wants or multiple wants and are a varying importance

(ii) Scarce means having alternative uses

(iii) Economic problem.

The comparative study of both the definitions is given below:

ALFRED MARSHALL	ROBBINS
1. Social Science In economics we study that person who is passing an ordinary life i.e., the person who is living in a society, who helps others and influences others and he is helped, co-operated and influenced by others.	**1. Impartial Science** In economics we study the person either living in a society or not i.e., either passing an ordinary or extra ordinary life but the only condition is that he faces economic problem arising because of unlimited wants and scarce means which have alternative uses.

2. Classificatory Marshall through his definition classified economics in two ways: (a) We shall study that person who is living in a society and not the person who is not living in the society. (b) We shall study only that part of individual and social action which is most closely connected with the attainment and with the use of material requisites of well-being i.e., material welfare and does not study non-material requisites.	**2. Analytical** As against Marshall, Robbins in his definition of economics has only analysed the facts of life. According to Robbins there is no classification between person living in a society and person not living in a society, between material welfare and non-material welfare but the only point of study is the causes of economic problems which are appearing due to multiple wants and scarce means which have alternative uses.
3. Restricted the Scope of Economics Marshall has restricted the scope of economics by considering only an ordinary person and only material requisites and by excluding extra-ordinary business of life and material requisites of well being.	**3. Widened the Scope of Economics** Robbins has widened the scope of economics by considering ordinary and extra ordinary persons and taking into account material and immaterial requisites. Because in his definition of economics he has not shown a distinction between ordinary & extra ordinary person and material and immaterial requisites.
4. Welfare a Non Measurable Concept The definition is based on material welfare. Welfare is a mental phenomenon. The concept of welfare is different in different minds. It varies place to place and person to person. There is no measuring rod to measure welfare.	**4. No Non-Measurable Concept** Robbin's definition is based on facts of life i.e., unlimited wants and scarce resources. He has not used any non-measurable concept. Because the wants and means both can be measured with the help of money prices.
5. Subject Matter of Economics The subject matter of Economics is the "attainment and the use of material requisites of well being", i.e., material welfare.	**5. Subject Matter** The subject matter of economics is the "unlimited wants and scarcity of means i.e., economic problem.

6. Science of Human Welfare Marshall's definition of economics is based on material welfare. Thus, according to him economics is a science of human welfare. Because only those activities are included in the study of economics which result in material welfare.	**6. Positive Science** Robbins made economics a positive science so economics is free from the responsibility of making value judgments. No longer its function is to examine the right or wrong of an economic activity.
7. It Corresponds to Modern Economic Theories The main object of modern economic theories e.g., economic planning, economic development and economic growth is the material welfare and the main object of marshallian definition of economics is also the material welfare.	**7. It does not Correspond Modern Economic Theories** The definition does not explain about the modern economic theories due to the reason that he has made economics an impartial science which is free from goodness or badness of wants.
8. Normative Science According to Alfred Marshall economics is a social science and it is an art, so in economics we not only study economic problems but also suggest remedies.	**8. Positive Science** Robbins made economics a positive science. According to him the duty of an economist is to find the causes of economic problems and not to give suggestions.
9. Macro Aspect Marshall's definition of economics is nearer to macro approach as it studies material welfare which is a result of macro aspects like economic planning and economic development.	**9. Ignored Macro Aspect** Robbins ignored the macro aspects and it only studies micro aspects because there is no sign of macro economic problems in his definition of Economics.

CONCLUSION

From the above comparison we may conclude that both definitions have merits and demerits e.g., the merits of Marshall's definition are that he made economics a social science whose object is material welfare and corresponds to modern economic theories. The merits of Robbins definition of economics are that he made economics a science and widened the scope of economics. While the demerits of Marshall's definition of economic are that he restricted the scope of economics and ignored the services (i.e., immaterial requisites); the demerits of Robbins definition are that he made economics a positive science just like Physics and Chemistry which deal with matter and does not study modern economic problem like unemployment, inflation, low living standard etc.

From the above we may conclude that if the base is social science and welfare then Marshall's definition of economics is superior and if the base is scientific view and the scope of the subject then Robbins's definition of economics is superior.

SCARCITY PROBLEM

"The evolution of the subject economics is due to the basic problem of mankind that the ends are unlimited and the means are scarce".

Whenever individuals or communities cannot obtain everything they desire simultaneously, choices occur. Choices occur because of scarcity. Scarcity is the most basic concept in all of economics.

Scarcity means that we do not and cannot have enough income or wealth to satisfy our every desire. Scarcity exists because human wants always exceed what can be produced with the limited resources and time that nature makes available. Scarcity is not a shortage. Therefore, do not confuse the concept of scarcity, which is general and all-encompassing, with the concept of shortage as evidenced by people waiting in line to obtain a particular good. Scarcity is not same thing as poverty. It occurs among the poor and among the rich. Even the richest person on earth faces scarcity because available time is limited. Low income levels do not create more scarcity. High income levels do not create less scarcity. Scarcity is a fact of life, like gravity. And just as physicists did not invent gravity, economists did not invent scarcity — it existed well before the first economist lived. It exits even when we are not using all of our resources.

MULTIPLE WANTS

On the other hand, "Ends" refer to wants. Human beings have wants which are unlimited in number. If one want is satisfied another crops up. Multiplicity of wants calls forth ceaseless effort of their satisfaction, and the unending cycle of economic activity moves on. If wants had been limited, they would have been adequately satisfied and there would have been no economic problem; all incentives to economic effort would have ceased. Also since human wants are unlimited, one is compelled to choose between the more urgent and less urgent wants. That is why economics is also called a "Science of Choice".

Therefore economics is the study of choices among scarce means and unlimited ends. It creates different portfolios of goods and services to take the maximum satisfaction of the unlimited wants by utilizing the limited resources.

NATURE AND SCOPE OF ECONOMICS

While studying scope of Economics we should study the definitions of economics. Beside indicating the subject matter of economics, we should decide whether in economics individual behaviour is studied or collective behaviour is studied whether economics is a science or an art, whether it can pass moral judgment, and whether it is an impartial science or it studies goodness or badness of wants. The answer to the above is explained below:

1. SUBJECT MATTER OF ECONOMICS

Different economists have different opinions regarding subject matter of economics. According to Adam Smith and his followers the subject matter of economics is wealth, i.e., consumption, production, distribution and exchange of wealth. According to Marshall and his followers the subject matter of economics is the material welfare i.e., the "Attainment and the use of material requisites of well-being, they advocate that economics is a study of wealth but the most important is the study of man. According to Robbins, the subject matter of economics is the economic problem i.e., the problems arising due to multiplicity of wants and scarcity of means which have alternative uses. According to Lord Keynes, the subject matter of economics is the "The determination of National income, Employment and Rate of interest". We may conclude that the approach of economists prior to Keynes was micro and the approach of Keynes and his followers is macro.

2. DOES ECONOMICS STUDY HUMAN BEHAVIOUR INDIVIDUALLY OR COLLECTIVELY

Economics is a social science (A man is social when he is living in a society) so if we study the human behaviour individually we can neither solve economic problems nor we can derive economic laws, because the attitude, sentiments of different people are different and as a result we can not benefit from the subject, e.g., when price of a commodity increases normally people purchase smaller amount of that commodity, but there may some who will purchase more to snob. Therefore, in economics we study collective human behaviour instead of individual human behaviour.

3. ECONOMICS A SCIENCE OR AN ART

There is difference of opinion among the economists about economics being science or an art. Some economists declare economics a pure science while other an art. While deciding whether a particular subject is entitled to be regarded science or not we should be clear what science is.

What is Science?

We may define science as "It is the collection of facts regarding any research work which is based on impartial analysis, experiments or observations and a casual relationship between the causes and results if established. Science is not merely a collection of facts, but the facts are so arranged that they speak for themselves. If the criterion is this, then economics is surely a science because in economics facts are collected and are carefully analysed and general principles governing these facts are discovered and framed. If we expect a science to formulate laws applicable everywhere and to all times and to predict the future course of events then, economics is not a science. The modern economists fully agree that economics is a full-fledged science. Economic laws are on all fours with the propositions of all other sciences.

What is an Art?

Art may be defined as "The implementation of the proposals on a certain matter of facts. Economist is like a doctor who examines the patients and finds the causes of disease and then prescribes medicines. He is not like a philosopher who examines the problem just for the sake of problem. In economics we not only discuss the nature and causes of economic problems but also their solution is proposed. e.g., when there is an increase in demand than the supply, price level goes up. We not only find the causes of increase in price level but also suggest solution.

So economics is both a science and an art. It is a science in its methodology and an art in its application. It has a theoretical aspect as well as practical aspect.

4. IS ECONOMICS A POSITIVE SCIENCE OR A NORMATIVE SCIENCE

Positive Science

Positive science relates with the causes and facts about a certain problem and studied as "They are" in which a personal opinion is not involved i.e., a positive science only explains" what is or positive science only describes.

Normative Science

In Normative science the relationship between causes and facts are viewed with specific objectives and it is decided whether it should be or should not be or normative economics tells us "What ought to be"?

According to the classical economists, economics is a science and it is none of the function of an economist to comment the wants right or wrong and the economic situation. Robbins also reaffirmed the above view. But the Neo classical economists declare economics as normative science.

To answer, whether economics is a positive science or a normative science we may say that when we analyse the facts impartially it is a positive science and when we say that it should be like this it is a normative science. For example: when quantity of money and circulation of money increase as compared to goods and services produced in an economy, there is a hike in price level i.e., inflation. But during inflation the fixed income group suffers while producers enjoy so the price level should be stable.

Economics is, therefore, both a positive science and a normative science.

5. DOES ECONOMICS RELATES WITH GOODNESS OR BADNESS OF WANTS?

The classical economists were of the view that economics has no relation with the nature of wants. Robbins affirmed this view while Neo classical economists have different view. According to them economics is not impartial with the nature of wants. It is now an admitted fact that economics is a social science, so economics can not isolate itself from goodness or badness of wants.

ECONOMIC LAWS

Law can be stated as "a repeated action which holds good at every time and at every place or if an action is repeated again and again and we get the same result and the result holds good at every time and at every place it is called a law. Like other laws e.g., state laws, physical laws, moral laws there are also laws of economics. In economic laws that human behaviour is studied which is adopted by a social person during economic activities. Therefore, by economic laws we mean human behaviour which is adopted during economic activity. According to Marshall, "Economic laws, or statements of tendencies, are those social laws, which are related to branches of conduct in which the strength of motives mainly concerned and can be measured by money price". If we study behaviour of individuals during consumption, production, distribution, exchange, allocation of scarce means to unlimited wants we shall notice they behave in a certain manner. The generalization about human behaviour is called economic laws.

NATURE AND CHARACTERISTICS OF ECONOMIC LAWS

1. No Universal Truth

Economic laws are based on human behaviour and it is ever changing so economic laws are not proved universally.

2. Conditional

Economic laws relate with the changing human behaviour so they are proved under certain conditions. If all those conditions are not satisfied, the law does not hold e.g., Law of demand holds when income of the consumers, taste, fashion, prices of substitute etc., do not change.

3. Can not be Predicted

Economic laws are derived from human attitude and sentiments. The attitude and sentiments cannot be predicted, so the economic laws can not be predicted.

4. Based on Facts

The Economic laws are based on facts of life and in this way there is universal truth in them e.g., we all know when price of commodity increases (cost of production being unchanged) the supply for that commodity extends.

5. Cannot be Tested in a Laboratory

Like other physical laws, economic laws can not be experimented and tested in a laboratory because the economic laws are merely the statements of tendencies and do not deal with matter.

6. No Punishment

Economic laws are not enforced and implemented by the state and if economic laws are violated no punishment is awarded to the violators. However those economic laws which are also state laws, if violated, the violators are punished, e.g., when price of commodity decreases the supply for that commodity contracts and the commodity is hoarded. But hoarding of necessities to earn more profits by creating shortage is a criminals offence.

7. Economic Laws are Elective

Economic laws are elective in nature. There is no compulsion to abide by economic laws.

8. Money as the Measuring Rod

The laws of economics are more exact than other social laws because they can be measured with the help of money price.

DIFFERENCE BETWEEN ECONOMIC LAWS AND OTHER LAWS

1. Economic Laws and Physical Laws

Physical laws deal with matter which is lifeless and can not refuse to conform to a certain behaviour. Matter acts and reacts according to the laws of nature that is homogeneity is found in the action and reaction of matter while economic laws deal with human behaviour which is ever changing that is why physical laws are universally true these can be tested and experimented in the laboratories, can be predicted and are not conditional. Physical laws are based on facts, and can be measured with the help of measuring rod. Economic laws deal with human beings so laws of economics do not prove universally true, because human behaviour a not homogeneous. Economic laws can not be predicted and experimented in the laboratories, can not be tested and are conditional. Like physical laws they are based on the facts of life and can be measured with money price. Physical laws have definiteness and certainty but economic laws lack and are hypothetically based on some assumptions.

2. Economic Laws and Moral Laws

Moral laws are either enforced by the religion (In Islam through Quran and Sunnah) or by the society itself. laws of morality are enforced and made keeping in view the specific objectives. As against state laws, there is no punishment inflicted by the government. Economic laws are neither enforced by the religion nor by the society but they come into existence as a result of human behaviour adopted during consumption, production, distribution and exchange. Like moral laws there is no punishment or violation of economic laws but all those economic laws which are also state laws, if violated there is punishment.

3. Economic Laws and Other Social Laws

The laws of economics are more exact than those of other social sciences, because the economic phenomena is capable of being measured in money price, while other social laws have no measuring rod like money price.

IMPORTANCE OF STUDY OF ECONOMICS

Economics has theoretical as well as practical importance.

THEORETICAL IMPORTANCE

1. Intellectual Values

Study of economics sharpens the intellectual values. It helps to understand the economic problems. A student of economics observes closely the human behaviour in the ordinary business of life and derives results after analysing facts.

2. Educational Benefits

In the modern times, education of a person cannot complete without the study of economics. Whatever is happening around us has economic importance. Even highly qualified person without the study of economics cannot fully understand the economic problems of today.

3. Useful Informations

By studying economics we get useful informations. Without the study of economics, National and International economic changes can not be understood. To understand the economic problems e.g., Inflation, economic depression, unemployment, low level of national income, low per capita income, unequal distribution of wealth and disequilibrium in balance of payments, study of economics is necessary.

4. To Understand the Working of Economic System

With the help of economics we are able to understand how economic system works and what are the basic problems of an economy (i.e., what to produce, how to produce, how much to produce and for whom to produce).

PRACTICAL IMPORTANCE

1. To Solve Economic Problem

All the countries of the world are facing economic problems like inflation, adverse balance of payments, unemployment etc., the study of economics not only helps to understand these problems but after analysing the causes of problems solution is also given.

2. To Consumers

Our wants are unlimited and the means to satisfy these wants are scarce so every consumer tries to maximise his satisfaction with limited income. The study of economics tells how a consumer achieves equilibrium position and maximises satisfaction with scarce resources.

3. To Producers/Entrepreneurs

Production process starts with the combination of four factors of production. The entrepreneurs employs the rest three factors and pay rewards to their owners. His basic aim is to maximise profits. Profits are the excess of total revenue over total costs. An entrepreneur can maximise his profits by diminishing cost and increasing revenue. The study of economics helps to understand how a producer or an entrepreneur can maximise his revenue and diminishes costs; what will be the level of output that will maximise his profits.

4. To Statesmen

Knowledge of economics enables the statesmen to grasp the political problems. They have to face the problems which are caused economically e.g., nationalization of industries, industrial and agricultural reforms, labour policy, dearness, inflation and unemployment etc. Especially in the modern world, the study of economics is the key to success.

5. To Labour Leaders

Study of economics helps to understand the industrial situations. Major demand of labour leaders is to enhance wages. Business undergoes changes e.g., boom, depression etc. Study of economics enables the labour leaders when to present their demands strongly and when to yield gracefully.

6. To Finance Minister

The foremost duty of Finance Minister is to prepare the national budget. He suggests new taxes or to increase the rates of old taxes to increase the revenue receipts. To solve the economic problems, economic planning is made. An exemplary taxation system is suggested. For this purpose the knowledge of economics is indispensable.

7. To Business

Study of economics helps to understand the principles of business organisation. A businessman can plan the business well and can easily grip the trade transactions and marketing problems.

8. To Exchange

None of the person can produce all the necessary goods and services himself. He has to depend on others. Surplus goods and services are exchanged. But to understand how exchange of goods, services and currency takes place and how prices of goods, services and currency are determined, study of economic is necessary.

9. For Citizens

By studying economics even an ordinary citizen is able to understand the economic problems and can analyse and criticize the government policies in a better way and can give his opinion which might be useful.

10. Makes a Man Social

Economics is a social science and studies that person who is living in a society, who helps, influences and cooperates others and is helped, cooperated and influenced by others, and thus teaches a person to be social.

11. To Economic Planning/Development

Independence and stability of a country depends on the economic prosperity and stability. If a country is not stable economically, it has to depend on foreign debts and the debts giving countries starts interfering the internal affairs, which endangers the integrity and freedom of the country.

A country is prosperous when it is economically developed and economic planning is a tool of economic development. Without economic planning none of the country can mobilize its resources and can utilize them properly. But to understand what economic planning is and how is it beneficial, we have to study economics.

12. To Underdeveloped Countries

An under developed country can especially benefit from economics, because it can compare its economy with the economies of developed countries and can understand that how developed countries had solved the problems of poverty, unemployment, adverse balance of payments and how they increase their national income, per capita income and standard of living. Study of economics helps to solve the above problems and to accelerate the development rate.

DESCRIPTIVE, THEORETICAL AND APPLIED ECONOMICS

Economic Analysis and Policy

Economics depends on theoretical knowledge which is based on facts which in turn based on verified hypothesis. In the words of Boudling "Theories without facts may be barren but facts without theories are meaningless". A theory expresses a relationship between causes and effects. Economic theory involves generalisations which are the statements of tendencies (in general).

Analysis means to explain the facts scientifically in detail without any change in the facts. Economic theory provides us with tools of economic analysis which help in explaining economic phenomenon, in predicting economic events appearing in the economy showing its performance.

Different steps needed in constructing an economic theory are as follow:

1. Selection of a Problem

The important step in constructing an economic theory is the selection of a problem which must relate to the real and dynamic world.

2. To Formulate Hypothesis

Second step is to formulate hypothesis about the economic problem to be analysed.

3. Predictions and Testing of Predictions

Third step for constructing an economic theory is to derive implications from the parameters and conditions by the process of logical deductions and tested by the process of general observations and statistical data.

Economic Policy

Economic policy provides us practical shape to economic theory. Economic theory and policy are closely related to each other. It is the knowledge of economic theories that leads to the laying down of economic policies.

Economic policy falls into two main classifications namely: those of micro economic policy with the objective of improving the efficiency of resource allocation and macro economic policy with the objective of securing a full use of resources and price stability.

Economic Methodology

Economics is a science and uses scientific methods:

(i) A hypothesis (prediction) is constructed about economic behaviour which would be right or wrong.

(ii) A model is built to describe the behaviour of economic variables (influencing factors) involved in the initial hypothesis.

(iii) The hypothesis is tested against empirical (real world) evidence by use of the model.

(iv) If the hypothesis cannot be disapproved, it becomes an accepted theory.

The Deductive Method

Deduction proceeds from the particular to the general or from the universe to individuals. The deductive method denounces new conclusions from the assumptions. If involves certain steps (i) the formulation of assumptions.

(i) The process of logical reasoning to draw conclusions.

(ii) The verification of conclusions arrived at.

Merits of Deductive Method.

(i) It is a method of intellectual experiments.

(ii) It is simple because it is analytical.

(iii) It is a powerful method for deriving conclusions from certain facts.

(iv) Because of mathematical base. It is exact and clear for economic analysis.

(v) It is useful where experimentation is not possible.

The Inductive Method

This method is the process of reasoning from particular facts to general principles. It is based on four steps:

(i) observation

(ii) formulation of hypothesis

(iii) generalisation

(iv) verification.

Merits

It is based on facts and explains them as they actually are:

(i) It helps in future enquiries.

(ii) It makes use of statistical analysis.

(iii) It is dynamic in nature.

(iv) A generalisation drawn under this method is historical relative in economics.

CONCLUSION

For economic analysis not a single method can be adopted for exact and correct conclusion both the methods are used simultaneously.

Different types of economics can be explained with the help of a model.

ECONOMICS

Descriptive Economics

In this part of economics facts are collected regarding any specific economic problem

Theoretical Economics

In this part of economics, economic system of different countries are explained and discussed Theoretical economics can be further sub-divided into two kinds.

Applied Economics

In this part of economics practical efforts are made to solve the economic problems

Theoretical Economics

Positive economics

In positive economics it is explained that how a society decides about consumption, production distribution and exchange and how economic system works.

Welfare economics

In welfare economics besides collection of facts suggestions, proposals are also given so as to increase the welfare of the people.

Positive Economics can again be subdivided into two types

Micro Economics

In Micro economics individual decision making units are studied and analysed e.g., consumer's behaviour, Firm's behaviour, etc.

Macro Economics

In Macro Economics the aggregates e.g., National income, employment, inflation, poverty, balance of trade, terms of trade, rate of interest aggregate savings, investments, demand and supply etc. are studied.

MICRO-ECONOMICS AND MACRO ECONOMICS

(A) MICRO ECONOMICS

The word micro means a millionth part. When we speak of micro economics we mean a small part of whole economy that we are analysing or in micro economics we analyse the units e.g., a firm, a consumer or an industry. In other words we study an individual decision making unit. For example: while studying price we do not study the general price level instead we discuss price of a particular commodity. While studying rewards of factors of production, we study rewards of F.O.P. in a particular industry. We study individual factors of production, savings, investment, income, employment, demand and supply and not the aggregate savings, investment, national income, general employment, aggregate demand and aggregate supply.

While studying micro economics it is assumed that there is full employment in the economy and average price level is fixed and hence, the problem left with us is what to produce, how to produce, how much to produce and for whom to produce.

In micro economics following problems are discussed and studied:

1. Consumption Theory

We study the behaviour of the consumers i.e., why people purchase consumer goods, what is their aim both in utility and indifference curve analysis.

2. Production Theory

In this part of study we discuss how goods and services are produced and how factors of production are combined together. What is the cost of production and how it can be minimised.

3. Price Theory

In price theory problems of determination of prices of goods and services are studied. The effects of price mechanism, affects the allocation of resource, consumption pattern, investment direction, choice of method of production. etc.

4. Distribution Theory

In distribution we study pricing of factors of production. Determination of rent, wages, profits and interest i.e., how rewards of factors of production are distributed in an industrial unit.

(B) MACRO ECONOMICS

In Macro Economics we study how the aggregates and averages of the economy as a whole are determined and what causes fluctuations in them. Macro economics is also called the national income employment and rate of interest theory or product theory or economics of aggregates. In macro economics the concepts of national income, its determination and distribution, total output aggregate consumption, aggregate savings, aggregate investment aggregate demand, aggregate supply and rate of interest are discussed. In Macro Economics we discuss generally the following:

1. Theories of Income Employment and Rate of Interest

In this part the concept of national income, its determination, relationships between income and consumption, investment rate of interest and savings are studied. principles of multiplier and acceleration are explained.

2. Theory of Trade Cycles

The problems arising due to fluctuations in price level e.g., inflation, deflation, depression are discussed. It is studied how trade cycles are occurred and removed.

3. Money Theory

The problem relating to determination of value of money, demand for money and supply of money are studied.

4. Theory of International Trade

The problems relating to international trade e.g., exchange rate, exchange control, tariffs, quotas, protection, economic order and balance of payments etc., are discussed.

MERITS OF MICRO ECONOMICS

Following are the merits of study of micro economics:

1. Individual Decisions

Micro economics is helpful for analysing individual decision making units e.g. households and firms.

2. Rational Choices

Study of micro economics is useful for making rational decisions regarding maximisation of satisfaction by the consumers and maximisation of profits by the producers.

3. Helps in Understanding Macro Economics

Macro economics is nothing but the addition of individual behaviour as a society is composed of individuals, macro economics is composed of micro economics. Therefore, study of micro economics means study of macro economics as a whole.

DEMERITS OF MICRO ECONOMICS

1. In free economy there are always problems of depression, over production and price fluctuations, so there is no stability in economy and these problems are not studied at micro level.
2. Some results are beneficial at individual level but are worse at national level e.g.
   (a) Increase in profits due to increase in prices is treated good for a producer but general increase in price level produces inflation in the economy which is harmful.

(b) A producer can increase its profits by reduction in wage rate but if wage cut policy is adopted in the country it decreases the purchasing power, which in turn will decrease the demand for investment and creates unemployment.

(c) Increase in personal savings looks good, but if major portion of income saved is not further invested it brings depression. Increase in monetary savings is not beneficial because it will not bring economic development.

(d) Increase in consumption at individual level is not treated good but if consumption expenditure decreases beyond a certain level in the economy rate of investment goes down and therefore, unemployment increases in an economy.

MERITS OF MACRO ECONOMICS

1. The most modern, theories like economic planning and economic development are studied in macro economics only.
2. Some decision cannot be made at individual level e.g., increase in wage rate, taxation system and changes in rate of interest.
3. Most of the economic problems of the Modern era e.g., unemployment high growth rate of population, adverse balance of payments, inflation, depression and low rate of economic development and economic growth are studied only in macro economics.
4. For economic stability the policies can be framed at national level.

DEMERITS OF MACRO ECONOMICS

1. In the boom period when most of the firms are earning profits there may be some firms which are facing losses.
2. If an individual unit is not working efficiently, it cannot be seen in macro economic study e.g., while studying aggregate savings and investments it is not possible to find out where the savings and investment rate is high and where it is low.

SHORT QUESTION ANSWER

Select the best answer for each of the following items:

Q.1 What do you understand by "Economics as a science of wealth"?

Ans. Classical view of economics (OR) Economics as a science of wealth: The classical economists under the leadership of Prof. Adam Smith described economics as:

"Science of wealth" Adam Smith discussed the concept of economics in the research paper. "An enquiry into the nature and causes of wealth of nations".

Q.2 Give Neo classical view of economics.

Ans. Neo classical view of economics (OR) Alfred Marshall's definition of economics: "Economics is the study of mankind in the ordinary business of life. It examines that part of individual and social action which is most closely connected with the attainment and the use of material requisites of well-being. Thus it is on one side is a study of wealth and on the other and more important side is the study of man" (i.e., human material welfare).

Q.3 Describe in short the subject matter of economics.

Ans. Subject Matter of Economics: According to classical economists the subject matter of economics is wealth to Neo classical economists, the subject matter of economics is material welfare, to Prof. Robbins the subject matter of economics is "Economic Problem" and to Keynsian and post Keynseian economists the subject matter of economics is the determination of national income, employment and rate of interest".

Q.4 Give definition of economics as given by Prof. Robbins.

Ans. Definition of Economies by Prof. Robbins: "Economics is the science which studies human behavior as a relationship between unlimited ends and scarce means which have alternative uses".

Q.5 What the conditions of an economic problem as stated by Prof. Robbins?

Ans. Conditions of Economic Problem:

(i) Human wants (ends) are unlimited.

(ii) All the human wants are not equal in nature.

(iii) The means to satisfy unlimited wants are scarce.

(iv) The scarce means, have alternative uses.

Q.6 Define human wants and differentiate economic and un-economic wants.

Ans. Human Wants: The meanings of wants are similar to desires or needs. It is not necessary for a desire to be backed up by economic activity while a want is backed up by economic activity.

(a) Economic Wants: The wants which require economic activity or price is paid are called economic wants.

(b) **Uneconomic Wants:** The wants which do not require economic activity or price is not paid e.g., air, sunlight, rail etc.

Q.7 What are the main characteristics of wants?

Ans. Characteristics of Wants:

(i) Human wants are unlimited.
(ii) Human wants are of varying importance.
(iii) Compete with are another.
(iv) Can be satisfied by different means.

Q.8 What do you understand by the concept of scarcity of resources?

Ans. Scarcity of Resources: Scarcity means more scarce or demand exceeding the supply. Scarcity exists because human wants always exceed that can be produced with the limited resources and time that nature makes available. Scarcity is not a shortage. Therefore, does not confuse the concept of scarcity which is general and all encompassing, with the concept of shortage as evidenced by people waiting in line to obtain a particular good.

Q.9 When a resource is scarce?

Ans. Scarce Resource: A scarce resource is a resource for which the quantity demanded at a nit price would exceed the available supply.

Q.10 Is economics science or an art?

Ans. Economics is both a science and an art. It is science in its methodology and an art in its application. It has a theoretical aspect as well as practical aspect.

Q.11 Whether economics is a positive science or a normative science?

Ans. When we analyse the facts impartially it is like a positive science and when we give suggestions it is like a normative science.

Q.12 What is an economic law?

Ans. Economic Laws: Economic laws or statements of tendencies, are those social laws which are related to branches of conduct in which the strength of motives mainly concerned and can be measured by money price".

Q.13 Give nature of economic laws.

Ans. Nature and Characteristics of Economic Law:

(i) No universal truth
(ii) Conditional
(iii) Cannot be predicted
(iv) Based in facts
(v) Cannot be tested in a laboratory
(vi) No punishment on violation
(vii) Money as a measure

Q.14 Differentiate between micro and macro economics.

Ans. Micro and Macro Economics: In micro economics we study individual decision matring units and in macro economics we study of aggregates or aggregate economy or national economy or economy as a whole.

EXERCISE

Q.1 Explain the definition of Economics given by Alfred Marshall. Also explain its merits and demerits. (OR)

"Economics is a study of mankind in the ordinary business of life". (OR)

Economics is a study of mankind in the ordinary business of life. Critically examine the statement. (OR)

"Economics is a science of material welfare". Do you agree with the statement?

Q.2 Explain the definition of economics given by Lynol Robbins. (OR)

Examine critically Robbins's definition of economics. How does it differ from earlier definitions. (OR)

Give merits and demerits of Robbins's definition of economics. (OR)

Economics is the "Science of Choices". Discuss. (OR)

Multiplicity of wants and scarcity of means are the two foundation stones of economics". Explain it critically. (OR)

"Economics is a Science and Studies allocation of scarce resources to the alterriative uses". Critically examine. (OR)

Economics is a Science of scarcity. Discuss.

Q.3 Compare Marshall's definition of Economics with that of Robbins's definition of economics. Which definition is superior and why? (OR)

Make a comparative study of the definitions of Economics as given by Marshall and Robbins. (OR)

Compare Science of choices with science of material welfare. (OR)

Science of choices is superior to science of material welfare. Discuss.

Q.4 How does an economic problem arise? Discuss. (OR)

"Multiplicity of wants and scarcity of means are two foundation stones of economics". Explain. (OR)

Do you agree that economic problems arise due to multiplicity of wants and scarcity of means? (OR)

An economic problem arises only when:

(a) Wants are unlimited and their importance varies.

(b) Means are scarce and have alternative uses. Discuss. (OR)

Economics is a science of choices. Discuss.

Q.5 Discuss Nature and Scope of Economics?

Q.6 What do you understand by an economic law? How does it differ from:

(a) Laws of Physical Science?

(b) The laws of state and

(c) Moral Laws. (OR)

What is meant by economic laws. Explain nature and characteristics of economic laws. How do they differ from other laws? (OR)

Discuss the nature and limitations of economic laws. Compare economic laws with state laws, laws of physics, moral laws and other social laws; (OR)

"Economic laws or statements of tendencies". Discuss.

Q.7 What is the purpose of studying economics? Does the knowledge thus gained help in practical life. (OR)

What are the theoretical and practical benefits of study of economics. (OR)

Write an explanatory note on the useful study of economics. (OR)

Why you have selected subject of economics for present examination? How it appears to be useful to study economics?

Q.8 Differentiate between descriptive economics, theoretical economics and applied economics. (OR)

Make a comparative study of different types or kinds of economics.

Q.9 Differentiate between micro and macro economics. How they are useful in understanding the economic analysis? (OR)

Write comprehensive not on micro economics and macro economics. (OR)

Distinguish between micro and macro economics. Which one would you prefer for understanding modern economic problems. (OR)

Give merits and demerits of micro and macro economics.

✿ ❶ ✿

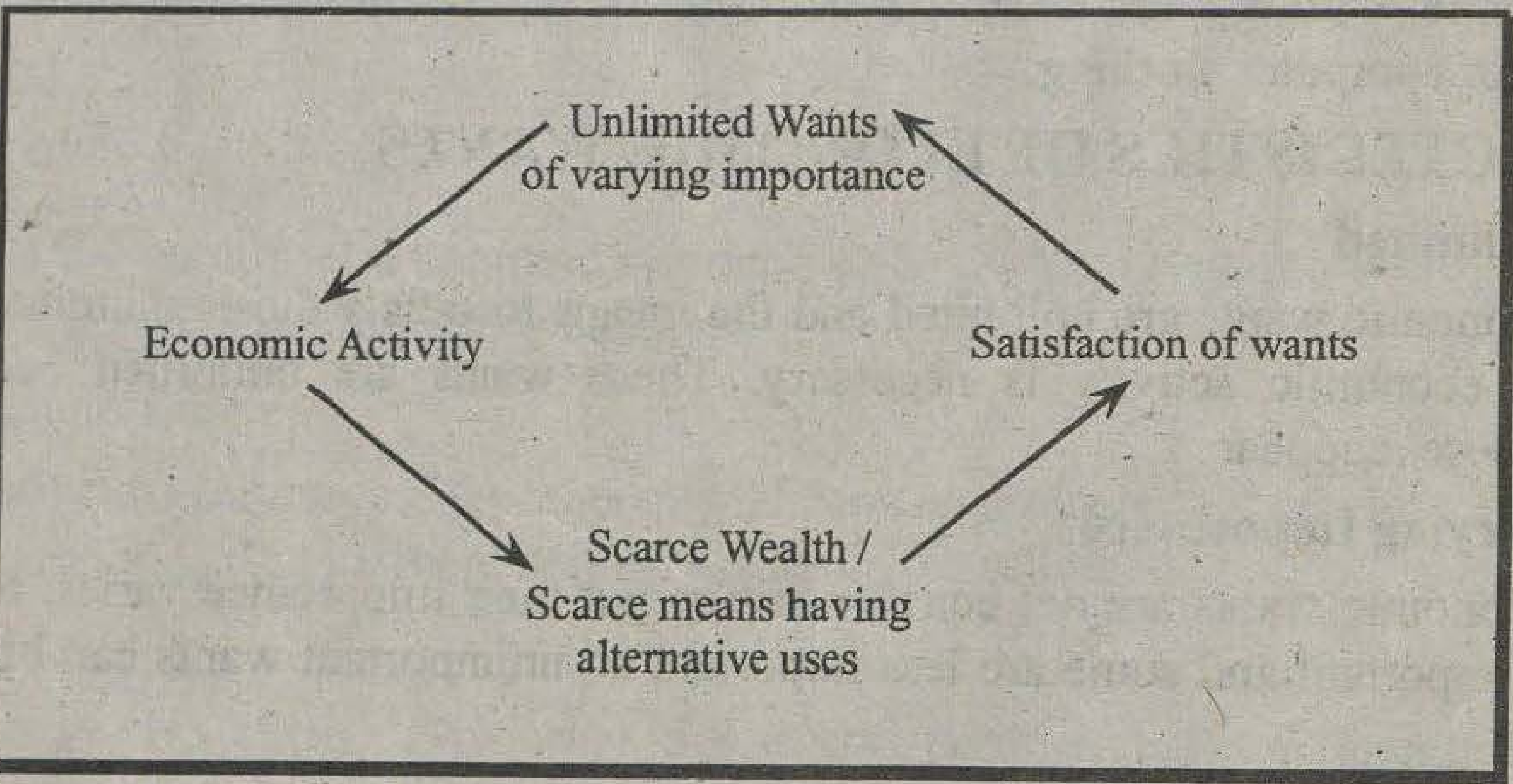
goods touchable thing
Service Nontouchable thing

CHAPTER 2

CONSUMER BEHAVIOUR AND ITS ANALYSIS

HUMAN WANTS

The meanings of wants are similar to desire or need. It is not necessary for a desire to be backed up by economic activity while a want is backed up by economic activity. The wants are unlimited in number, if one want is satisfied another crops up and these wants also appear again and again hence, multiplicity of wants requires endless efforts for their satisfaction. These wants are satisfied with goods and services. Because human life depends on these wants so economic activity is necessary. Basically there are three wants; food cloth and shelter. There are hundreds of wants which make the life comfortable and luxuries e.g., Refrigerator, T.V, V.C.R, Motor Car, Calculator, Air Conditioner, etc. We may conclude that the base of economic activity is human wants. The endless cycle of human wants and economic activity can be explained as follows:



We start economic activity to satisfy unlimited wants consequently, we get limited wealth and with the help of wealth we try to satisfy unlimited wants but wants reappear and the means to satisfy unlimited wants are scarce so again we have unlimited wants.

KINDS OF WANTS

1. Economic Wants

Those wants which require economic activity i.e., to satisfy those wants price is paid e.g., sugar, rice, wheat, milk etc.

2. Uneconomic Wants

Those wants which do not require economic activity or to satisfy these wants price is not paid e.g., air, sun-light, moon-light, rain etc., or the free gifts of nature. In economics, we are only concerned with economic wants.

GRADES OF WANTS

There are three grades of wants explained below:

1. Necessities of Life/Basic Wants

Those wants without which, we can not live or difficult to live even impossible to live are called necessities of life e.g., food, cloth and shelter.

2. Comforts or Facilities

These wants are not necessary to lead life but if we satisfy these wants, life becomes comfortable and easy e.g., motor cycle, room cooler, refrigerator etc.

3. Luxuries

Those wants with which we can live luxuriously e.g., if a middle class employee has a motor car, Air conditioner etc. these are luxuries for him.

But we cannot name any good or service a necessity comfort or luxury. For this purpose, we shall have to see that who is using that good or service e.g., an air conditioner is a luxury for a clerk a comfort for a high official or businessman and necessity for computer working.

CHARACTERISTICS OF ECONOMIC WANTS

1. Unlimited

Economic wants are unlimited and the means to satisfy these unlimited wants are scarce so economic activity is necessary. These wants are unlimited because once satisfied these reappear.

2. Varying Importance

Economic wants are not equal in nature but their importance varies. Some wants are more important and some are less important so unimportant wants can be postponed or ignored.

3. Compete with each other

As Economic wants are unlimited and are of varying importance and the means to satisfy these wants are scarce so more important and less important wants compete with each other. More important wants win while less important are either discarded or postponed.

GOODS AND SERVICES

Quality of a commodity which can satisfy any human want good or bad is called "Utility" and the commodity or thing in which utility is found is called a "good", e.g., food, cloth, shelter. Different people satisfy other people's wants with their profession, job, specialization. These are called services e.g., services of a doctor, engineer, professor or an advocate etc. Three conditions of goods and services are utility scarcity and transfer ability. Goods are of two types:

(a) Consumer Goods

(b) Capital Goods

(a) Consumer Goods

The goods which are used directly by the people i.e., get direct satisfaction and are not used for earning more income e.g., all those goods which we consume daily e.g., Ghee, Sugar, Milk, T.V, Refrigerator, Room cooler, Fan etc. Consumer goods consist of services, perishable goods and durable goods. These provide direct satisfaction to the consumers and are not used for earning more income.

(b) Capital Goods

All those goods which are not consumed directly by the people i.e., these do not provide direct satisfaction and are used to earn further income are called capital goods e.g., goods sold on shops, land, labour machinery etc., these are generally man made.

Although it is very easy to differentiate between a consumer good and a capital good yet we can not draw a line of distinction between them e.g., if a van is being used for personal purposes it is a consumer good and when it is used for earning income it is a capital good.

UTILITY

It is the quality of a commodity which can satisfy any human want good or bad. Utility depends upon the following factors:

(a) Human Desire

Utility depends upon the intensity of human desire and demand. Greater is the human desire for a commodity or service greater is the utility.

(b) Use

Utility also depends on use. Some commodities have different uses. More important is the use, greater is the utility and vice versa e.g., Electricity has greater utility in industry and agriculture while less utility in households for running Air Conditioners.

(c) Shape

Utility varies with the shape e.g., cotton has less utility but when cotton is converted into cloth its utility increases.

(d) Knowledge and Information

Knowledge and information bring change in utility e.g., when we had less information and knowledge about sui gas it was only used in fire places but with the passage of time it is now being used for running factories and presently is being used in motor cars in the shape of C.N.G. so its utility has increased.

(e) Change in Time

In summer season ice has greater utility while in winter season it has little thus, utility changes with the change in time.

(f) Change in Place

When place is changed utility also changes e.g., Red chilly has more utility in Asia while less in Europe.

(g) Change in Ownership

When ownership of a goods changes utility also changes e.g., tractor has greater utility for a farmer while zero utility for a doctor.

WEALTH OR ECONOMIC WEALTH

In ordinary sense by wealth we mean gold, silver, ornaments and money while in economics every thing which can satisfy any human want, which is scarce and whose ownership can be changed i.e., every thing which has value in exchange is wealth. Three characteristics are necessary for wealth:

(a) Utility (b) Scarcity (c) Transferability

We may conclude that every thing with which we can satisfy any human want is wealth. e.g., wheat, sugar, fan, cloth, fruit, etc. By scarcity, we mean whose demand is greater than the supply i.e., economic activity is required to have it and price is paid. Scarcity does not mean that commodity is available in less quantities e.g., quantity of salt is less than the wheat but salt is not as scarce as wheat because demand for wheat is greater than its supply while demand for salt is less than its supply. The third characteristic of wealth is the change in ownership. The change in ownership may be physical or in papers. If there is no utility in commodity and is not scarce no one will accept it. If a commodity cannot be transferred it will not be able to give satisfaction so it will not be a wealth. OR economic wealth can be defined as the stock of net assets possessed by households, firms, and the state. Economic wealth may be of three types according to possession. i.e., (i) Personal wealth (ii) Business wealth (iii) National or social wealth.

VALUE

In economics is value is defined as, it is the power of a commodity which can have other things in its exchange. e.g., sugar can be exchanged with wheat, rice etc., it means these have value. There are two kinds of value.

(a) Value in Use

Air, rain, sun-light, summer season, winter season etc., all have value but there is no need of economic activity or price is not paid for them. They have value in use and can not have things in their exchange. Those things which have value in use are not discussed in economics.

(b) Value in Exchange or Exchange Value

All the economic goods and services have value in exchange. A commodity has value in exchange only when there is utility in it, it is scarce, and is transferable.

Note: The concept of utility, scarcity and transferability have been discussed above.

Greater is the utility, scarcity and transferability greater is the value in exchange.

The difference between wealth and value is that, wealth is material and value is immaterial.

CONSUMPTION

It is a process whereby utility found in goods and services is consumed either at once or gradually during its use. We may conclude that consumption is:

(a) Consumption of utility gradually

(b) Consumption of utility either at once or gradually

(c) Consumption of utility during use.

PRODUCTION

Production means a process to create value in things but generally in economics, we study the principles of producing goods i.e., land owners, rent capital, owner's interest, labour's wages and organization's profit.

DISTRIBUTION

In distribution, we study the distribution of rewards to the factors of production. i.e., land owners, rent capital, owners interest, labours, wages and organizations profit. i.e., we study pricing of factors of production.

EXCHANGE

Exchange simply means exchange of wealth but in wider sence by exchange, we mean price determination of goods & services.

PARAMETERS

In economics all the assumptions and the conditions in economic laws and theories are parameters e.g., in law of demand, income of consumer, price of the substitutes, new substitute are parameters. In law of diminishing return, Homogeneous units of variable factor of production, improvement in techniques of production are parameters etc. These are also known as assumptions, conditions, factors, determinants etc.

DRAWING A GRAPH

In mathematics independent variable is measured on X-axis and dependant variable is measured on Y-axis. In economics the same rule applies but with some exceptions. Although price of goods, rent, profits, interest, and wages are independent variables but are always measured on Y-axis (i.e. Price of goods & F.O.P.).

CARDINAL ANALYSIS OF CONSUMER BEHAVOUR

Marginal Utility M.U

Marginal utility can be defined as the change in the total utility resulting from one unit change in the consumption of the commodity per unit of time or it is the addition made to the total utility by consuming one more unit, next unit or the last unit of a commodity OR marginal utility is the rate of change of total utility. We can measure marginal utility with the help of following formula

$$\text{M.U.} = \frac{\text{dT.U}}{\text{dq}}$$

Where d, is rate of change (derivative a concept used in mathematics) and q means, units consumed

$$\text{OR Marginal Utility} = \frac{\text{Change in T.U.}}{\text{Change in per unit quantity consumed}}$$

Total Utility (T.U)

Total utility is the addition of marginal utilities or the utility derived from all the units of commodity consumed by a consumer.

Zero Utility

When there is no desire to consume more units of a commodity or a want is satisfied the utility is called zero. Or when there is no change in total utility by the consumption of more or additional units of a commodity.

Positive Utility

Utility greater than zero is positive i.e., until and unless there is a desire for a consumer to consume more units of a commodity utility is positive. If a unit of a commodity is yielding satisfaction to consumer it has positive utility.

Negative Utility

Utility less than zero is negative i.e., consumption of more units gives dis-satisfaction instead of satisfaction.

Relationship between Marginal Utility and Total Utility

There are four relations between M.U. and T.U.:

(i) When M.U. is positive, T.U. is increasing.

(ii) When M.U. is zero, T.U. is maximum.

(iii) When M.U. is negative, T.U. is diminishing.

(iv) T.U. is the addition of the MUs and M.U. is the change in T.U.

The relationship between marginal utility and total utility can also be explained with the help of schedule and diagram.

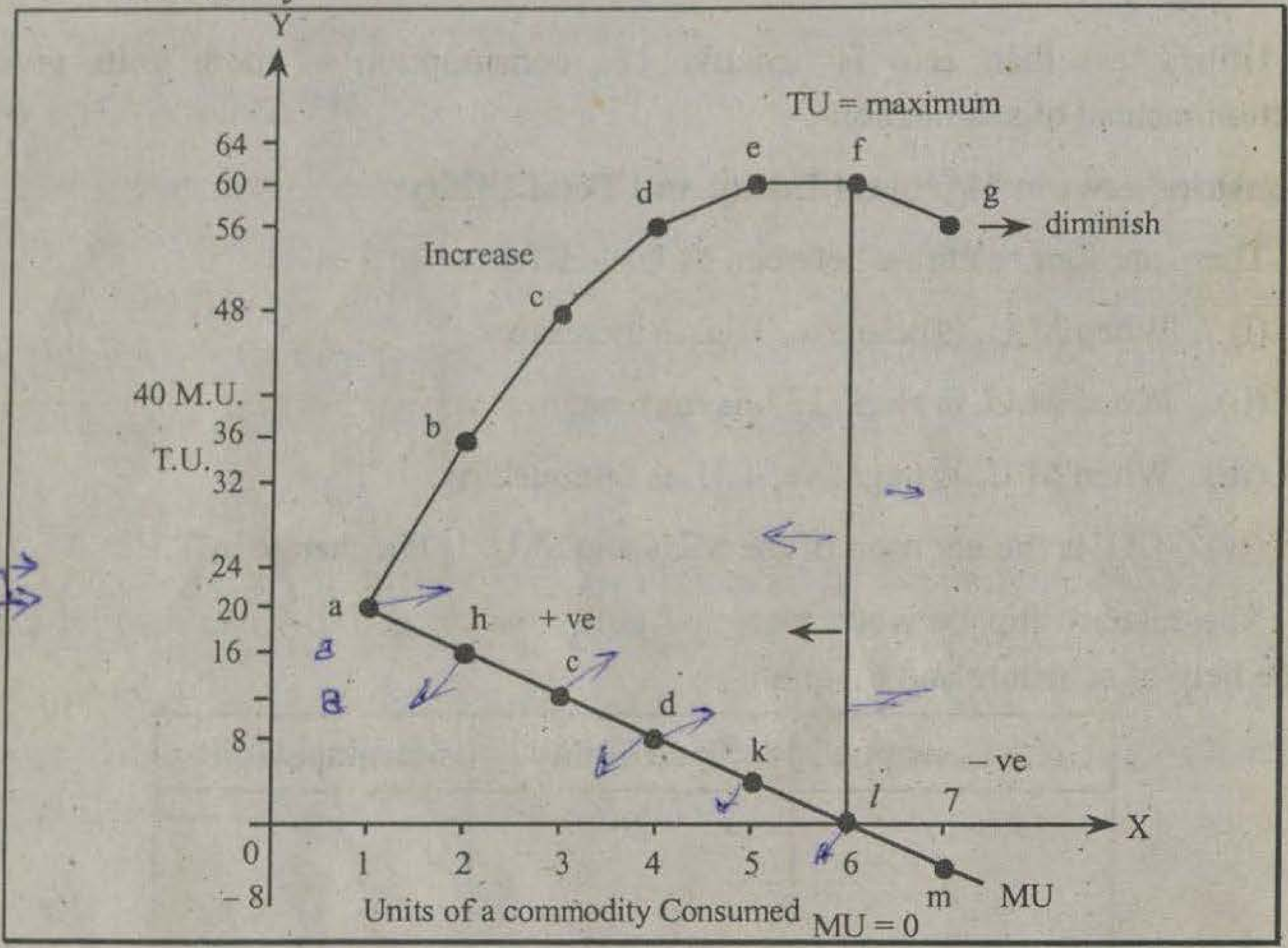
Units Consumed	Total Utility	Marginal Utility
1	20	20
2	36	16
3	48	12
4	56	8
5	60	4
6	60	0
7	56	−4

From the above schedule it is clear that:

1. When Marginal Utility is positive i.e., uptil 5th unit, total utility is increasing i.e., from 20 to 60.

2. When Marginal Utility is zero, total utility is maximum in the above schedule at 6th unit marginal utility is zero and total utility is maximum i.e., 60. (The utility of 6th unit is maximum because decreasing trend starts after 6th unit in T.U.).

3. When Marginal Utility is negative, total utility is diminishing. In the schedule, Marginal Utility is –4 at 7th unit and total utility has diminished from 60 to 56.
4. Total Utility is the sum of marginal utilities. The sum of marginal utilities of all the seven units consumed is 56. Marginal utility is the rate of change in total utility.



Units of commodity consumed have been measured on X-axis and utility on Y-axis. Total utility curve has been drawn by joining the points a, b, c, d, e, f and g and Marginal Utility curve has been drawn by joining points a, h, i, j, k, *l* and m.

Uptill 5th unit Marginal Utility is positive and total utility is increasing i.e., from point a to e. At 6th unit marginal utility is zero as shown by point 'f' and total utility is maximum i.e., 60. At 7th unit marginal utility is negative and total utility is diminishing. It has diminished from point f to g.

LAW OF DIMINISHING MARGINAL UTILITY

It is our common observation that when units of a commodity are consumed continuously the lateral units give less and less satisfaction to the consumer. In the beginning, we have strong desire to consume units of commodity but with the continuous consumption the desire for commodity to consume diminishes, as the want is satisfied. When the want is satisfied utility reaches to zero and then with the excessive use of units of commodity the utility become negative. The law of diminishing marginal utility expresses the decreasing relationship between the units of commodity consumed and the

OTHER LIMITATIONS

Following are the limitations of the law:

Note: Limitation mean that law applying upto some extent and after that it does not apply.

1. Knowledge

The law does not apply on knowledge. As a person acquires more and more knowledge his desire for getting more knowledge increases e.g., knowledge of different languages gives more and more utility to a person.

2. Income and Wealth

It is argued that as income of a person increases his desire to earn more income also increases, because more income means more wants to be satisfied.

3. Rare Collections/Hobbies

The law does not apply to rare collections. A person who is collecting old stamps, the more he is able to collect stamps, the greater will be his satisfaction.

4. Fashion/Ostentation

Utility of a commodity depends upon fashion, and ostentation. A dress in fashion or used to snob or ostentation, has greater utility and a dress out of fashion has less utility.

5. Intoxicants

The law does not hold good in case of intoxicants. A person who is addict of intoxicants his utility for successive units increases instead of decrease.

IMPORTANCE

1. For Consumers

Consumers benefit from this law while purchasing goods. When a consumer purchases goods he compares the marginal utilities of the commodities purchased and the price paid. If the M.U. is greater than the price, the consumer purchases more and stops purchasing when M.U. is equal to price.

2. For Taxation/Finance Minister

We know that M.U. of money for rich is less than the poor. The law provides the basis for taxing or changing the tax rates. Finance Minister benefits from this law. Higher tax rate is imposed on rich and lower tax rate on poor because M.U. of money for poor is more while less for rich.

3. Price Determination

The law forms a basis of theory of value. It explains how with an increase in supply (demand remains the same) the value of commodity falls.

4. Value in Exchange

The law explains which commodities have value in exchange. Air has value in use but no marginal utility while goods have value in exchanges because they possess marginal utility.

5. Basis for some Economic Laws / Theories

Economic laws e.g., law of equi-marginal utility has been derived from this law. The concept of elasticity of demand, consumer's surplus depends upon this law. Law of demand also depends on this law.

CONCEPT OF EQUI-MARGINAL UTILITY

The basic economic problem arises from the fact that our wants are unlimited and means are scarce. We have to make choice between unlimited wants and scare means, every rational consumer aims at the maximum satisfaction out of scarce means. Not only the theory of consumer behaviour but the whole economic theory is based on the principle of rationality of human behaviour which means that a consumer when faced with a problem of choice, he selects those commodities which are cheaper and give maximum satisfaction. Now the question arises how a consumer gets maximum satisfaction from the scarce means. The law of equi-marginal utility guides the consumer how he can get maximum satisfaction. According to law the consumer tries to distribute his income on various goods or he tries to balance the marginal utilities of various goods. Total utility is maximum when marginal utility derived from each good is equal, because in this way he becomes indifferent among different goods.

STATEMENT OF THE LAW

"Other things being constant (i.e., there is no change in assumptions) equilibrium position reaches when M.U's of all the commodities purchased are exactly equal"

ASSUMPTIONS/PARAMETERS CONDITIONS/FACTORS/DETERMINANTS

The law of Equi-marginal utility holds under the following assumptions:

1. Given Income

The consumer has given income to spend on various goods till it is exhausted.

2. Taste

The taste of the consumer during consumption of goods remains unchanged i.e., he does not prefer other commodities or rejects the old one during consumption.

3. Maximum Satisfaction

The basic aim of the consumer is to maximise his satisfaction out of his given income.

4. M.U. of Money does not Change

Marginal Utility of money to the consumer also remains constant during successive purchases i.e., it does not increase with the spending of money on purchases.

5. Law of Diminishing Marginal Utility Applies on Goods only

It is assumed that commodities consumed by the consumer are subject to the law of diminishing marginal utility i.e., every next unit of commodity yields less and less utility.

6. Substitution

The consumer substitutes one commodity for the other until whole the income he wanted to spend is exhausted. So as to maximise his satisfaction.

7. Utility is Additive Measurable and Comparable

Utility derived from different goods can be added and can be compared i.e., we can measure M.U. in numbers.

When expenditure of a consumer has been so adjusted that, marginal utility in each direction of his purchases is the same, it is called the consumer equilibrium.

In order to explain the law of equilibrium M.U. let us suppose that a consumer has a limited amount of Rs. 5/- which he has to spend on commodity A and commodity B. The marginal utility of both commodities is shown with the help of the following table:

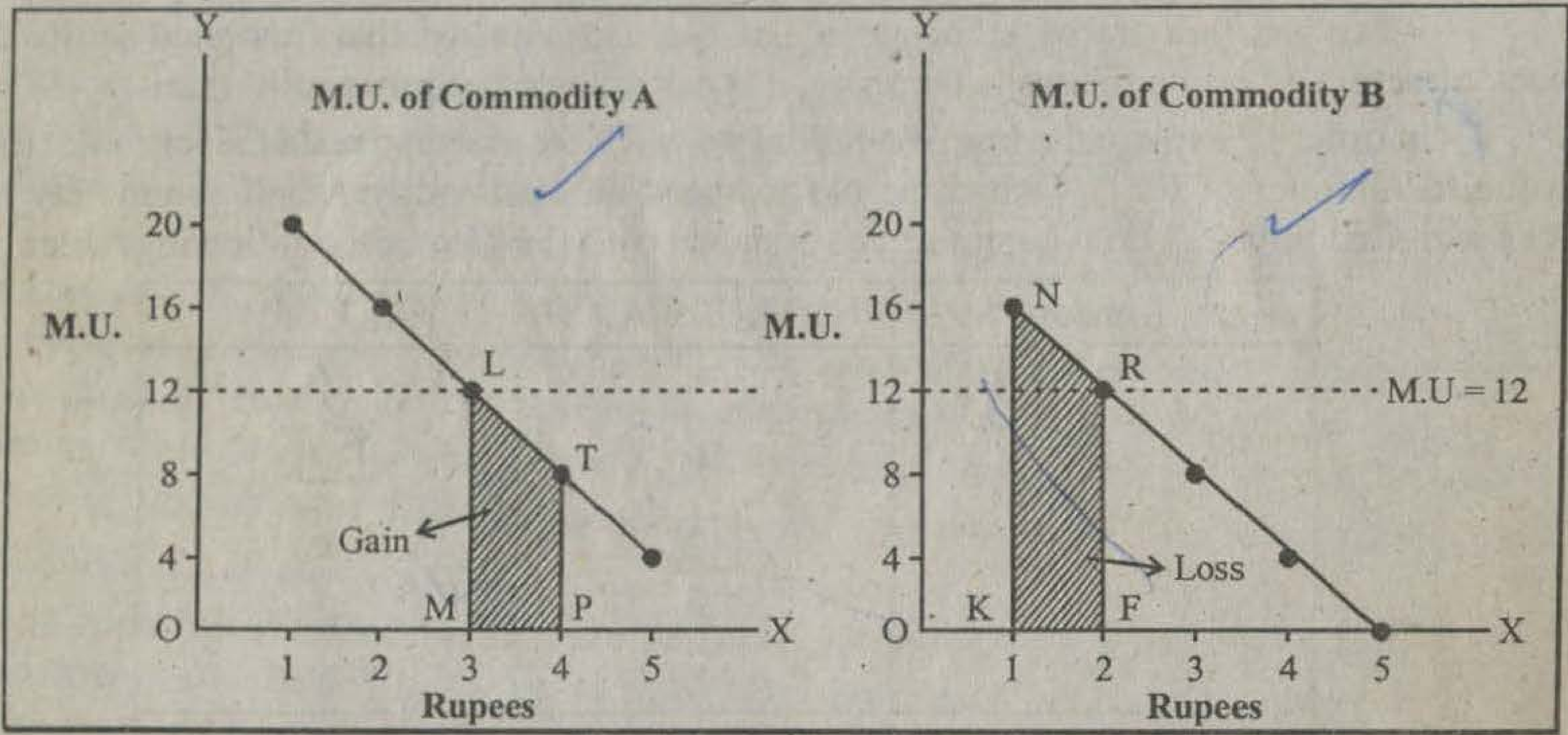
Rupees	M.U. of A	M.U. of B
1	20	16
2	16	12
3	12	8
4	8	4
5	4	0
Given amount Rs. 5/-	TU = 60	TU = 40

It is clear from the table that if the consumer spends whole of his amount on commodity A, total utility is 60 and if he spends five Rs. on commodity B, total utility is 40. But if the consumer spends 3 Rs. on commodity A and two Rs. on commodity B his total utility will be maximum because M.U. of last units is equal and if consumer spends his income except this, his total utility will not be maximum e.g., the maximum possible combinations are given below:

1. Total Utility by spending one Rs. on commodity A, and four Rs. on commodity B is (20) + (16 + 12 + 8 + 4) = 60.
2. Total Utility by spending two Rs. on commodity A and three Rs. on commodity B is (20 + 16) + (16 + 12 + 8) = 72.
3. Total Utility by spending three Rs. on commodity A and two Rs. on commodity B is (20 + 16 + 12) + (16 + 12) = 76 maximum.
4. Total Utility by spending four units on commodity A and one unit on commodity B is (20 + 16 + 12 + 8) + (16) = 72.

Which means that total utility is maximum only when the consumer spends three Rs. on commodity A and two Rs. on commodity B. That is why the law is called the "law of maximum satisfaction". As the consumer substitutes units of one commodity for the other so this law is called "law of substitution". When consumer achieves maximum satisfaction he becomes indifferent among the units of commodities, so the law is called the "law of indifference". As the M.U. of different commodities so achieved becomes equal so this is also called the law of "equi-marginal utility". As the consumer tries to get maximum satisfaction with less expenditure so this law also called the "law of economy of expenditure".

The law of Equi. M.U. as demonstrated in the above table may also be explained with the help of the following diagram.



In the above diagram it is clear that MU is presented on y-axis while amount of rupees is shown on x-axis. We have also presented DMU curves of commodity A and commodity B. It is also clear that when the consumer spends Rs. 3/- on commodity A and Rs. 2/- on commodity B, MU of both commodities is equal i.e., LM = RF = 12. Since MU of both commodities is equal, therefore, TU is maximum that is 20 + 16 + 12 + 16 + 12 = 76.

Now if the consumer spends one rupee more on commodity A by reducing one rupee from commodity B, he gains less utility that is 8 units and loses more utility that is 16 units. The gain of utility is shown by the area LMPT and the loss is shown by the area NKFR. Since the loss of utility is more than the gain of utility, therefore, total utility will be reduced from 76 to 68(76 + 8 − 16). Hence it is proved that total utility will be maximum only when MU of both commodities is equal.

LIMITATIONS (CRITICAL EVALUATION)

The law of equi-marginal utility does not appear to apply in the following cases:

1. **Measurement of Utility is Impossible**

Utility is a mental phenomenon so it is not possible for a consumer to show utility in numerical values so we can neither add, compare nor can equalise utility.

2. Indivisibility of Goods

Some of the goods cannot be sub-divided e.g., motorcycle, tractor, cow, T.V. Therefore, utility of individual parts cannot be compared.

3. Time Period

It is a rare chance that the goods purchased are exactly used during prescribed and given time period because some commodities are consumed before the expected period while some goods are used more than the expected period. So the idea of utility becomes wrong i.e., either we under estimate or over estimate utility.

4. Ignorance of Consumers

Sometimes consumers are not aware of the useful alternatives. Therefore no substitution takes place and the law does not hold.

5. Not Applicable to Small Purchases

The law holds only in big purchases/expenditures and is not applicable in small purchases because we do not care for smaller purchases i.e., act of rationality is missing.

6. Irrational Purchases

The law holds only when consumer is prudent and makes rational purchases but does not hold on irrational purchases. In developing Economics where people are consumption oriented and are always in involved in irrational purchases, law does not prove true.

7. Snobry/Ostentation/demonstration/presentation

Those goods which are used for snobry or ostentation the law does not apply because in such cases the consumer does not equalise marginal utilities or tries to attain maximum satisfaction.

8. Assumptions are Weak

The assumptions on which the law is based are weak and questionable, e.g., M.U. of money does not remain constant, utility is neither measurable nor additive, income of the consumer never remains unchanged and taste of the consumers always changing during consumption.

IMPORTANCE/EVALUATION/APPLICATION

1. Consumption

The basic aim of the consumer is to maximise satisfaction with limited income. Therefore, the law guides how a consumer can get maximum satisfaction out of scarce resources.

2. Production

An entrepreneur combines the rest three factors of production to maxmise profits. He combines these factors in such a way that marginal productivity is equal which is an equivalent concept to Marginal Utility.

3. Distribution

The reward of every factor of production tends to equal to its marginal productivity. This law proves useful in distribution of national income because the concept of Marginal productivity is parallel to concept of Marginal Utility.

4. Exchange

In all our exchanges, the principle of substitution applies because we purchase those commodities which are cheaper and utility is greater and reject or postpone those which are high priced and yielding less satisfaction.

5. Price Stability

If a commodity becomes scarce this law helps us. We start substituting less scarce commodities with the more scarce commodities. The scarcity of later is thus relieved which helps in stablising price of more scarce and less scarce goods and services examples are mutton and chicken etc.

6. Maximum Welfare

The basic aim of the government planning is to maximise social welfare. It tries to maximise welfare of the society with scarce resources. Which is parallel concept to maximum satisfaction used in the law of equi-marginal utility.

CONSUMER'S EQUILIBRIUM (GIVEN THE PRICES)

According to the law of substitution or equi-marginal utility a consumer is said to be in equilibrium position when he is getting maximum satisfaction out of scarce means or wealth. But in this analysis it has been assumed that prices of goods which a consumer intends to purchase remain constant during consumption but in real life he is not equalising the marginal utilities of different goods but the ratios of marginal utilities and prices are equal.

Consumer's equilibrium can be achieved when following variables are assumed to be constant:

(i) The basic objective of a consumer is to attain maximum satisfaction.

(ii) Consumer has given income to spend on different goods. (In this example Rs. 1250).

(iii) Prices are given in the market and do not change during consumption.

(iv) Marginal utilities can be added and compared.

(v) Law of diminishing marginal utility applies on successive purchases.

(vi) Marginal utility of money remains constant during successive purchases.

(vii) Consumer spends his income on different commodities.

Consumers equilibrium can be explained with the help of a schedule and formula:

Units Consumed	Marginal utility of commodity A Price per kg Rs. 200	Marginal utility of commodity B Price per kg Rs. 100	Marginal utility of commodity C Price per kg Rs. 50
1	600	500	300
2	500	400	250
3	400	300	200
4	300	200	150
5	200	100	100

Suppose a consumer has limited income of Rs. 125/= and if the MU and price of commodities A, B and C are given then equilibrium can be explain with the help of formula.

$$\text{Consumer's equilibrium} = \frac{MUa}{Pa} = \frac{MUb}{Pb} = \frac{MUc}{Pc}$$

$$\text{Consumer's equilibrium} = \frac{400}{200} = \frac{200}{100} = \frac{100}{50}$$

$$\text{Consumer's equilibrium} = 2 = 2 = 2$$

Amount spend on:

Commodity A = Rs. 600 (units consumed 3 × price per kg Rs. 200)

Amount spent on commodity – B = Rs. 400 (units consumed 4 and price per kg Rs. 100)

Amount spent on:

Commodity C = Rs. 250 (units consumed 5 and price per kg Rs. 50)

Total expenditure = Rs. 600 + Rs. 400 + Rs. 250

Total expenditure = Rs. 1250

Assumptions about Rationality

(i) The consumer prefers to more goods to less.

(ii) The consumer is willing to substitute one product for the other given the price.

(iii) Choices are transitive i.e., a consumer prefers product A to product B, and product B, to product C, and therefore, product A, will be preferred to product C.

(iv) Consumer attempts to maximize total utility or satisfaction.

(v) The consumer spends his income in such a way that he gets the same marginal utility from the last unit of money spent on all the products.

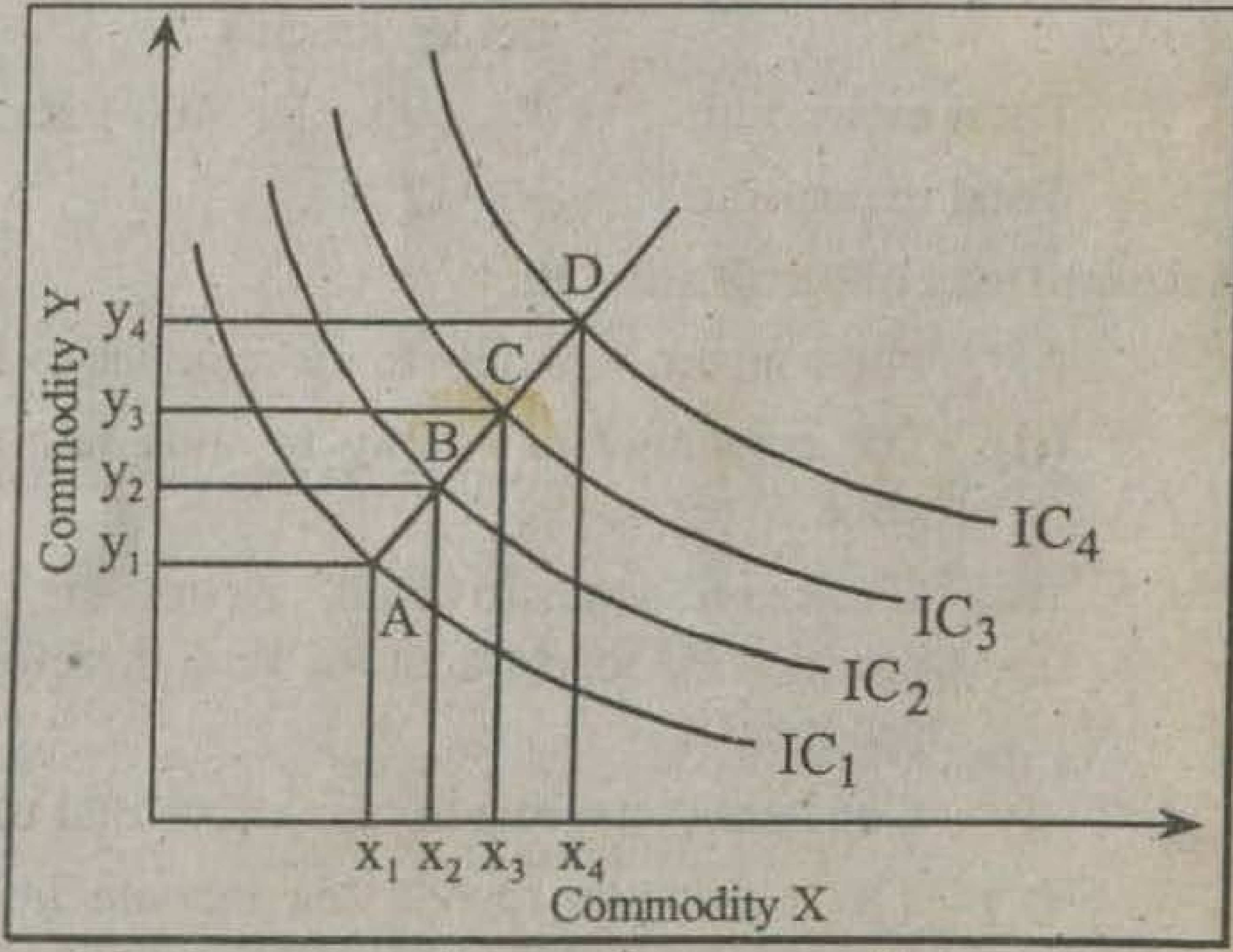
INDIFFERENCE CURVE ANALYSIS (ORDINAL ANALYSIS) OF CONSUMER BEHAVIOUR

The concept of indifference curves was first introduced by Prof. Edgworth and later on it was explained by the two economists named R.G.D. Allen and J.R. Hicks. According to them utility is not measurable and additive and the consumer does not purchase in single commodities but he is interested in different combinations of two commodities because the goods are perfect substitutes i.e., why it is also known as two commodity model.

What is an Indifference Curve (IC)?

Indifference curve means, the curve on which the consumer is indifferent. An indifference curve is a locus of points where each point represents a combination of two commodities and each combination gives equal satisfaction to the consumer. Or "An indifference curve represents satisfaction of a consumer from two commodities. It is drawn on the assumption that for all possible points on an indifference curve, the total satisfaction remains the same". Hence, the consumer is indifferent on an indifference curve. He does not prefer one set of combination of two goods to another set of combination of two goods. An indifference curve may be called as an Iso (same) utility curve. The slope of indifference curve shows the marginal rate of substitution i.e., the rate at which one commodity is being substituted for another. The marginal rate of substitution (MRS) is always falling so an indifference curve indicates falling marginal rate of substitution. The consumer has not only a single indifference curve in his mind but he has an indifference map. Lower indifference curve shows lower level of satisfaction and higher indifference curve shows higher level of satisfaction. (i.e., analysis also shows decreasing opportunity cost).

In the figure indifference curve IC_1 represents a lower level of satisfaction as compared with IC_2, IC_3, and IC_4. The indifference curve IC_4 represents a highest level of satisfaction as compared with IC_3, IC_2 and IC_1. The indifference curve analysis is based on the following assumptions:



ASSUMPTIONS

1. The consumer has indifference table showing his scale of preference for various combinations of two goods. The scale of preference is assumed to be constant.
2. The consumer is supposed to be with a given amount of money to spend on the goods. If he does not spend on one commodity, he must spend on the other commodity.
3. The prices of the goods included in combinations are assumed to be constant.
4. The consumer is assumed to be rational in his behaviour to attain maximum satisfaction.
5. The indifference curve analysis assumes the taste of the consumer constant over a period of time.
6. The indifference curve is supposed to be smooth and continuous in shape.
7. The consumer purchases goods in combinations and each combination gives equal satisfaction i.e., he does not prefer one set of combination to another set of combination.
8. Goods are perfect substitutes of one another.
9. The goods are divisible into smaller units.

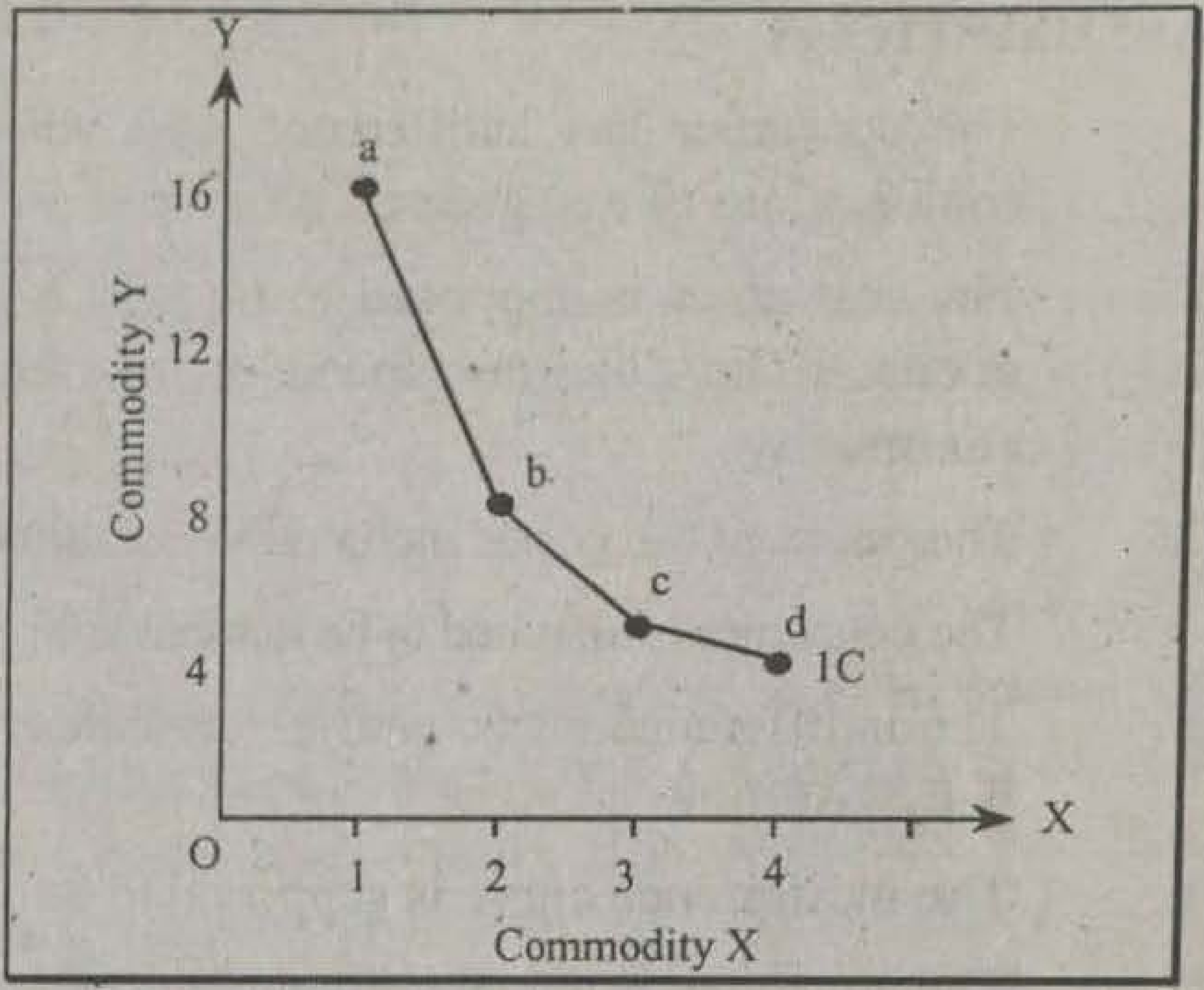
The concept of indifference curve can be explained with the help of a schedule and a diagram.

SCHEDULE

Combinations of two goods	Units of Commodity X	Units of Commodity Y
A	1	16
B	2	8
C	3	5
D	4	4

According to the table the consumer has 4 combinations of two goods and each combination gives equal satisfaction. If consumer consumes one unit of commodity X and 16 units of commodity Y, the consumer gets same satisfaction as he gets from 2 units of commodity X and 8 units of commodity Y, as 3 from units of commodity X and 5 units of commodity Y and as from 4 units of commodity X and 4 from units of commodity Y. Hence, the consumer does not prefer one set of combination to another set of combination. The table shows that marginal rate of substitution is falling. The consumer is willings to give less and less units of commodity Y for the same units of commodity X, because the quantity of commodity X is increasing while quantity of commodity Y is decreasing.

The schedule has been plotted on the graph. In the diagram commodity X have been measured on X-axis and units of commodity Y on Y-axis. Indifference curve IC has been drawn by joining the points a, b, c, d. The indifference curve IC is downward sloping and convex to the origin which shows falling marginal rate of substitution or decreasing opportunity cost.



CHARACTERISTICS/PROPERTIES OF INDIFFERENCE CURVE

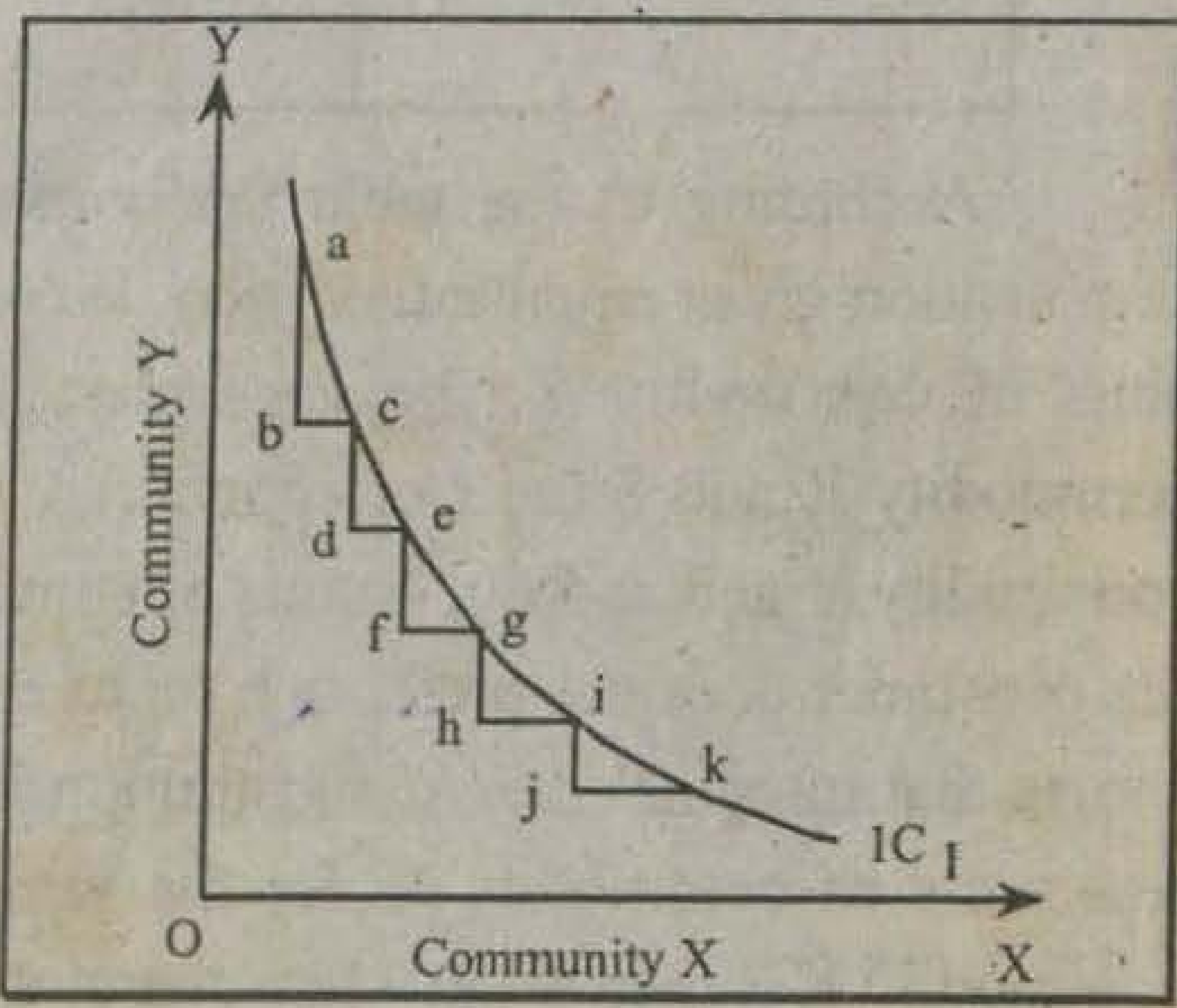
The indifference curves possess the following properties:

1. Indifference curves are convex to the origin.
2. Indifference curves are downward slopping to the right.
3. Indifference curves do not intersect each other.
4. Indifference curves do not touch either axis.
5. Indifference curves are smooth in nature.

1. Convex to Origin

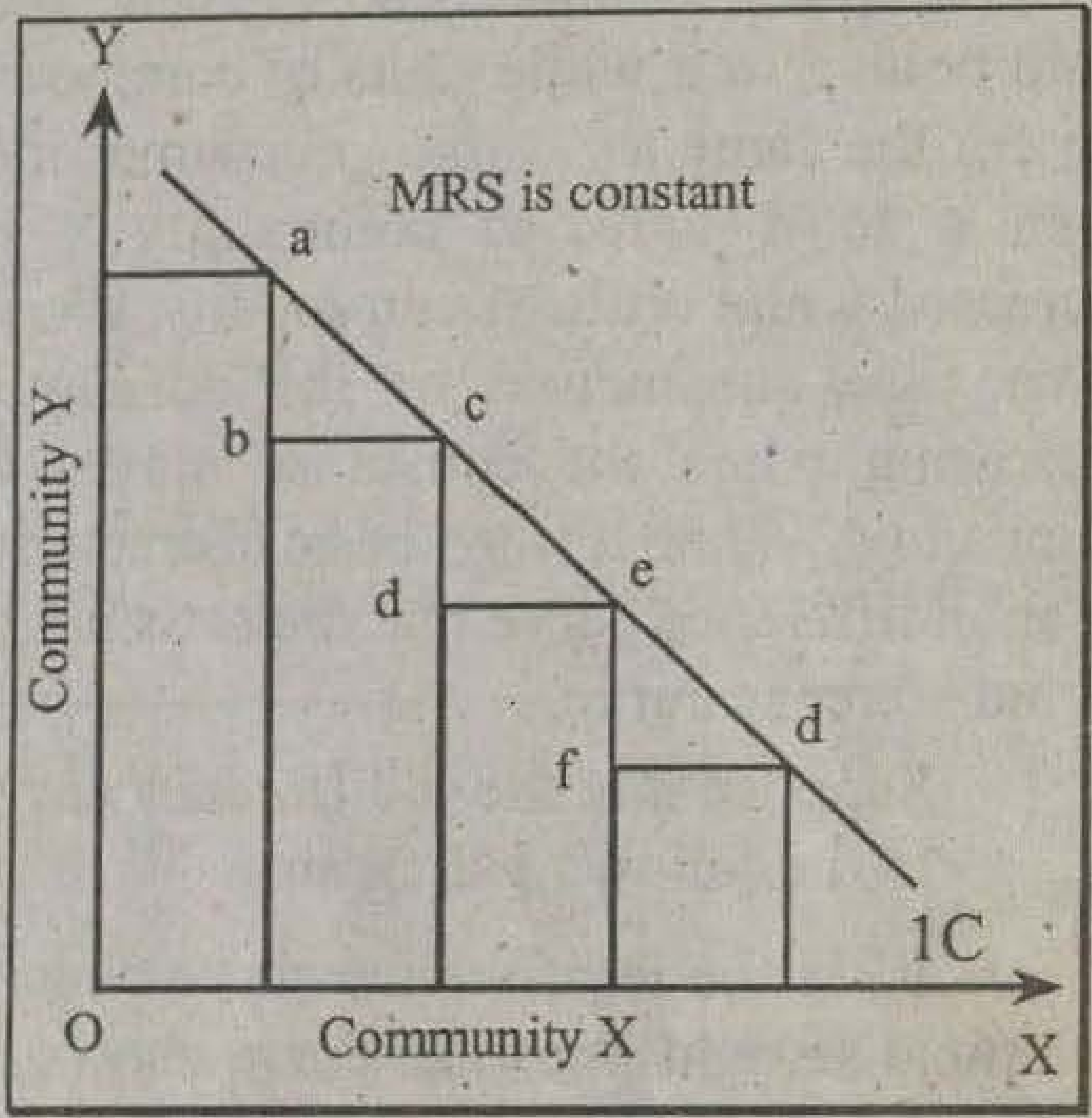
The indifference curve is convex to the origin because as we have more units of commodity X and less units of commodity Y, the marginal rate of substitution of X for Y goes on falling. This is explained with the help of a diagram.

It is clear from the figure that as the consumer is getting more units of commodity X he is willing to give less and less units of commodity Y as it is clear for the vertical distances of ab, cd and ef. The vertical distance of cd is less than the vertical distance of ab and vertical distance of ef is less than the vertical distance of cd. Which shows that the marginal rate of substitution of X for Y is falling and that is why this curve represents the indifference curve.



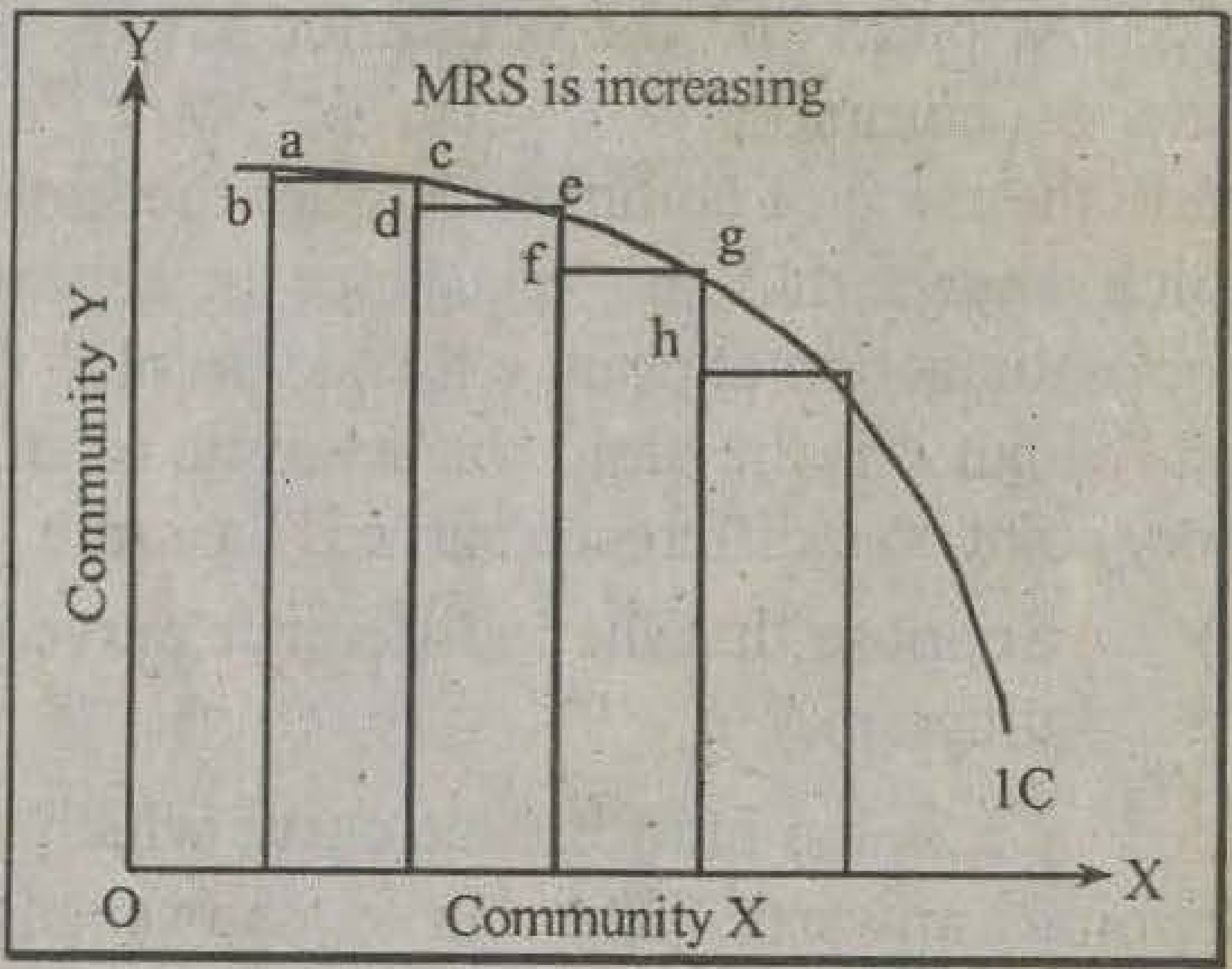
(a) Suppose that the indifference curve is not convex to the origin but it is a straight line with a downward slope as it has been drawn in the following diagram:

In the diagram IC is an indifference curve which is slopping downward. The vertical distance of ab, cd and ef are equal which shows that as the consumer has more units of commodity X, the consumer is willing to give the same units of commodity Y i.e., marginal rate of substitution is constant which is unnatural because law of diminishing marginal utility applies on these commodities. Hence it will not be an indifference curve.



(b) Suppose that the indifference curve is not convex but it is concave as it has been drawn in the following diagram:

IC is the indifference curve in the diagram. It is clear from the diagram that vertical distance, of cd is greater than ab and ef is greater than cd which shows that as the consumer has more units of commodity X, the marginal rate of substitution is increasing instead of decreasing which is unnatural because consumer will be willing to give less and less units of commodity Y for more and more units of commodity X where as in diagram the consumer is willing to give more and more units of commodity Y for more and more units of commodity X.

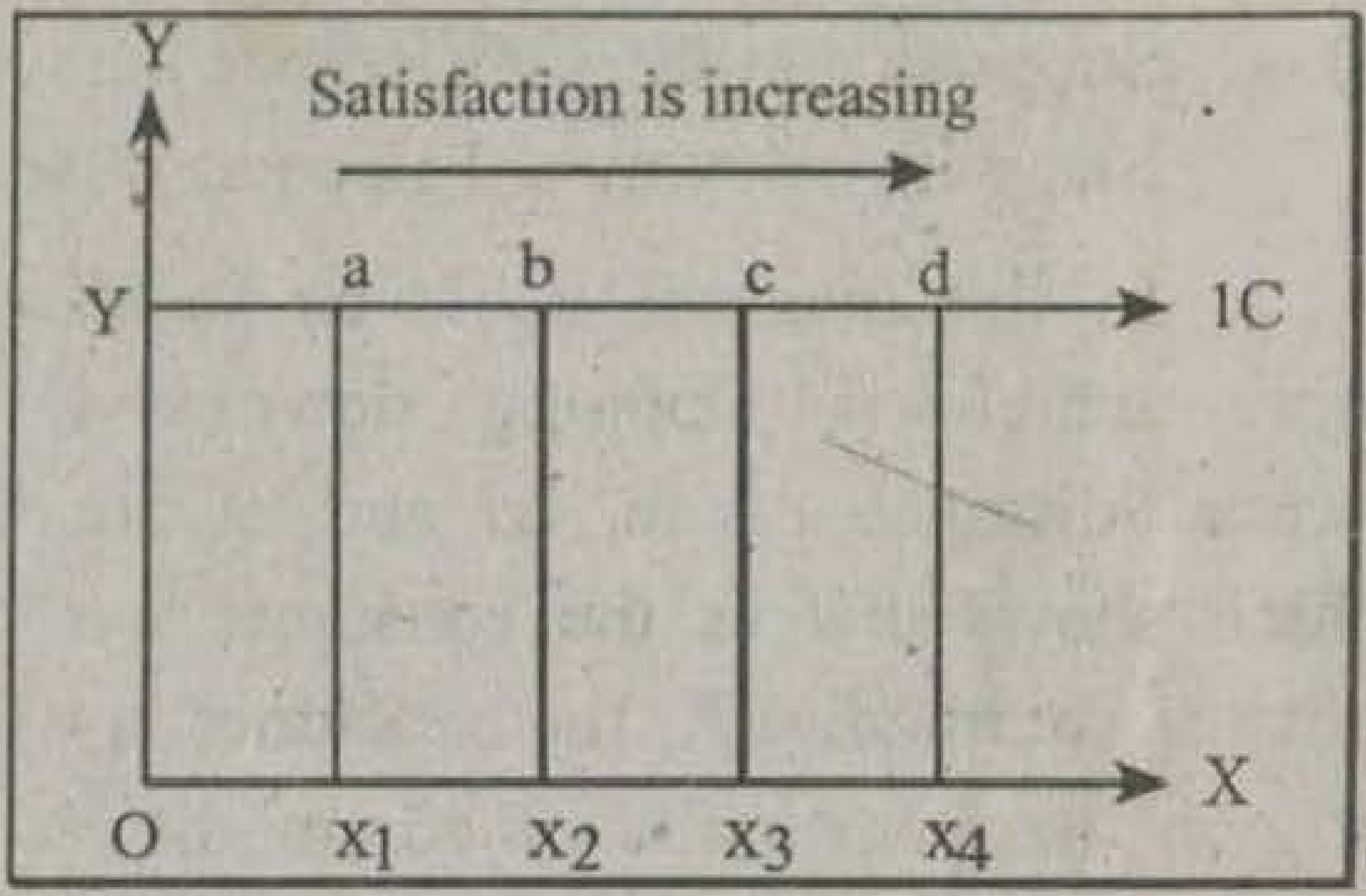


2. Downward Slopping to Right

Indifference curves are convex to the origin and slope downward from left to right as the slope of an indifference curve represents the falling marginal rate of substitution.

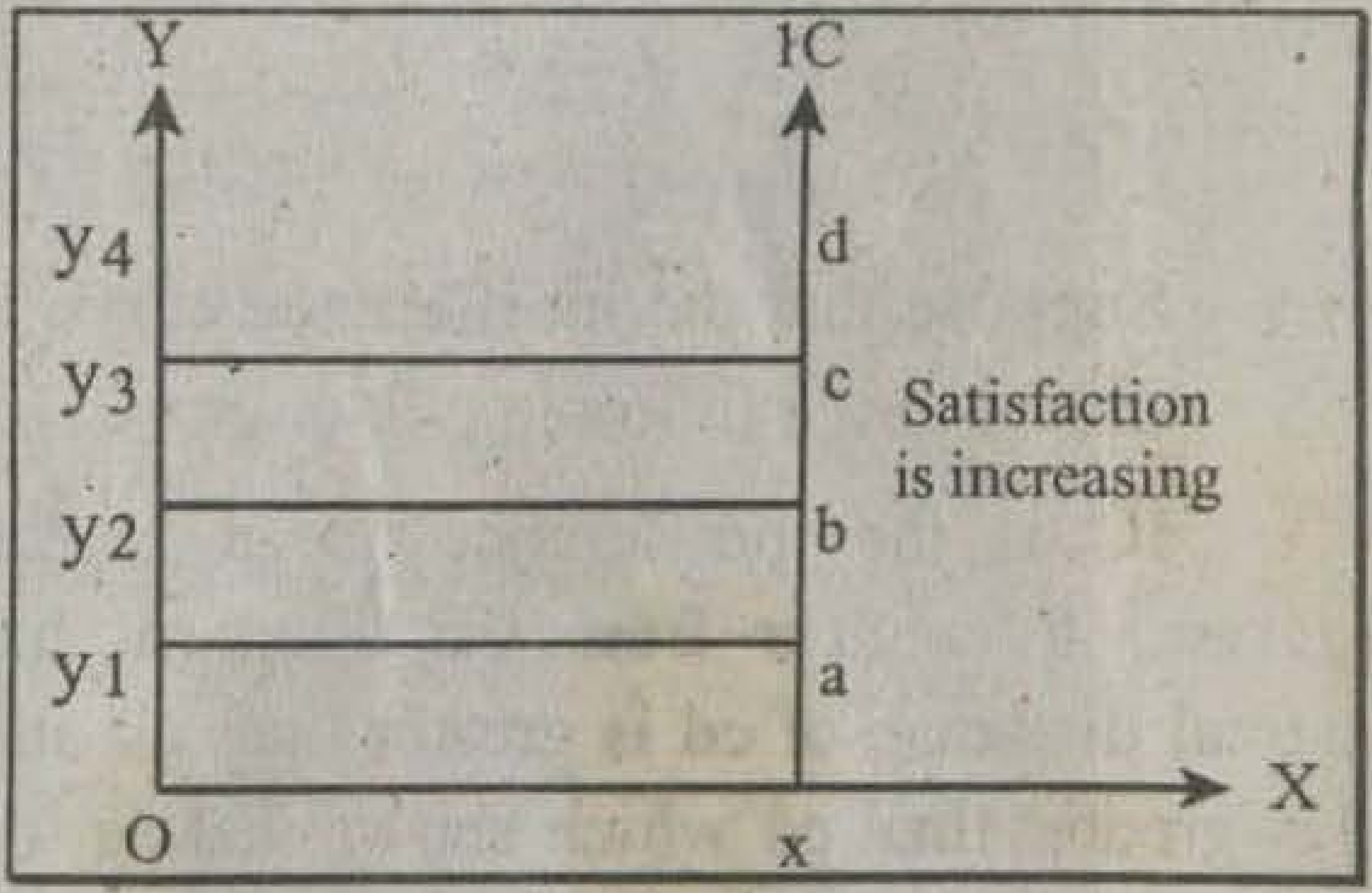
(a) Suppose that the indifference curve is straight horizontal line as it has been drawn in the following figure:

IC is the indifference curve. It is clear from the diagram that the consumer is getting more units of commodity x when he moves from point a to d while units of commodity y remain the same as the consumer moves from a to d units of commodity x have increased while units of commodity Y are the same. The satisfaction of the consumer is increasing when the consumer moves from point a to d. While it is the basic characteristics of an indifference curve that the satisfaction always remain the same. Hence, it will not be an indifference curve.



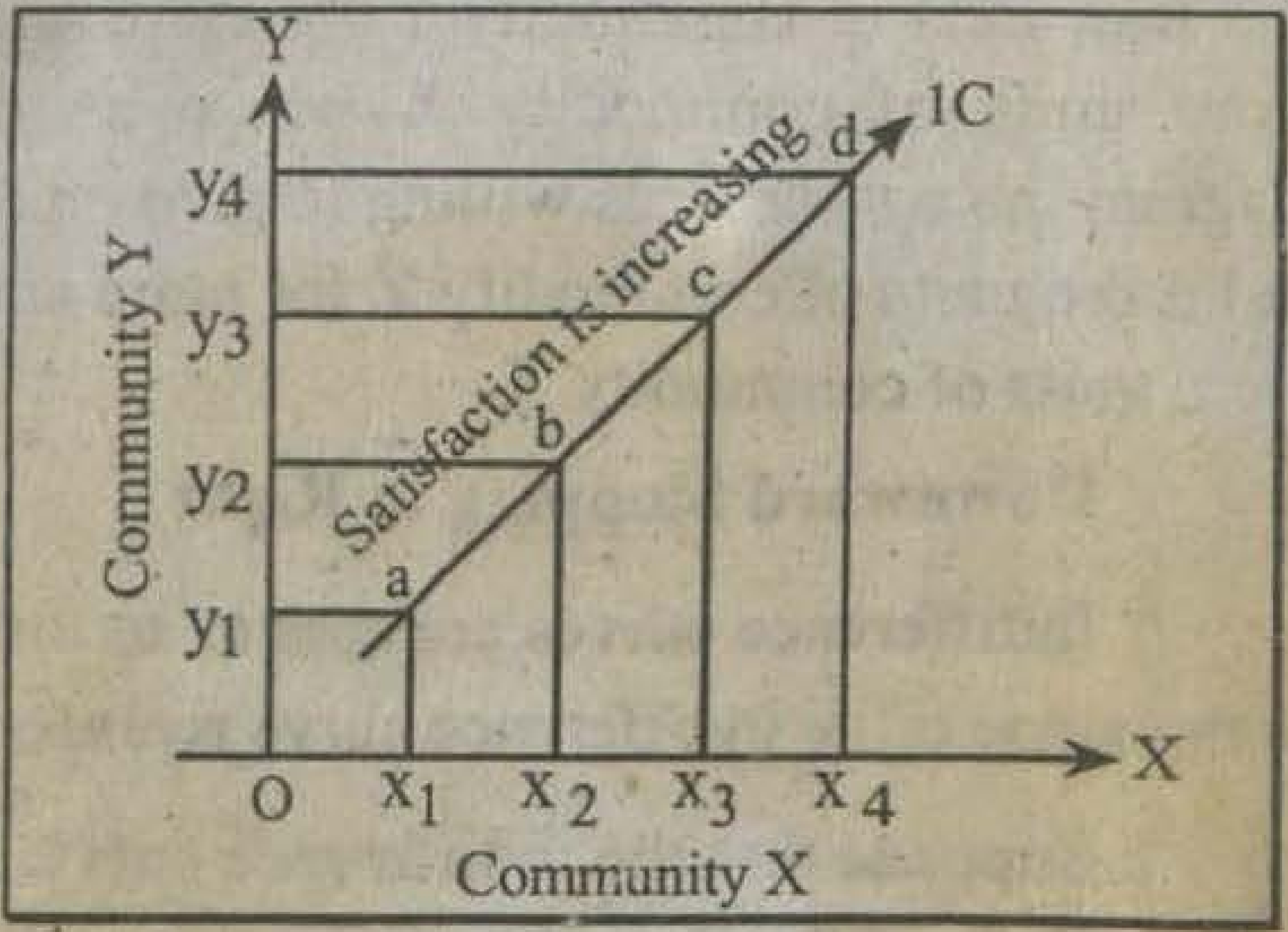
(b) Suppose that the indifference curve is a vertical straight line as it has been drawn in the following diagram:

IC is the indifference curve which is a vertical straight line. The curve shows that units of commodity x remains the same while units of commodity y, are increasing and consumer is moving from a to b and to b to c. At point "b" the consumer has more units of commodity Y than at point "a" while the units of commodity x are the same which shows that the consumer is getting more satisfaction at point c than at points "a" and "b" but it is the basic characteristic of an indifference curve that satisfaction on each and every point on indifference curve is the same. Therefore, it can not be an indifference curve.

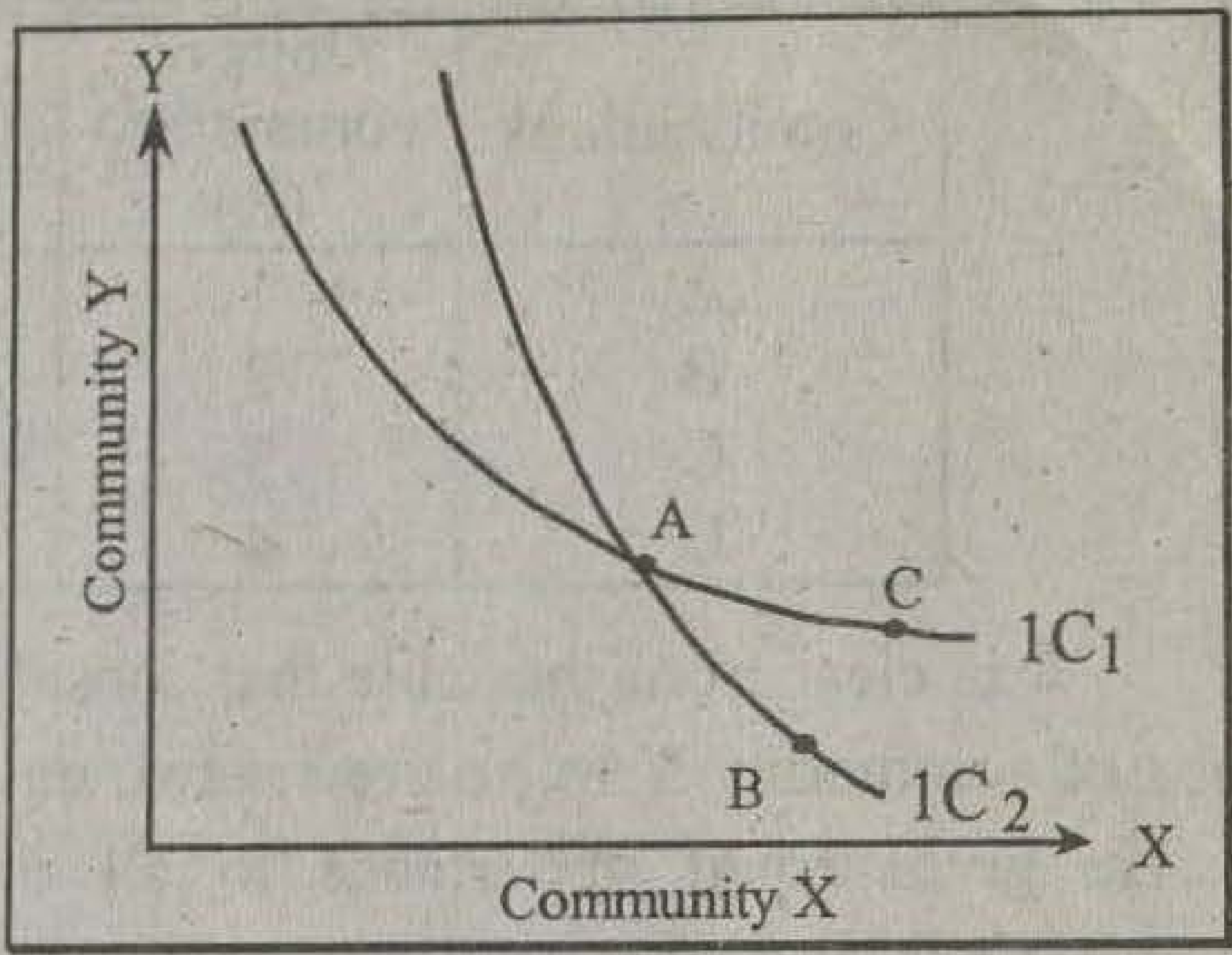


(c) Suppose that the indifference curve is upward slopping as it has been drawn in the diagram.

IC, is the indifference curve which is slopping upward. The curve shows that when the consumer is moving from points a to b, c and d, he is getting more units of both commodity x and commodity y i.e., his satisfaction at point "b" will be greater than point "a" and it will be maximum at point "d" than at points a, b, and c which shows that satisfaction on each and every point on the indifference curve is not the same therefore, it can not be an indifference curve.



3. Non Intersecting



The third property of the indifference curve is that indifference curves do not intersect each other. Suppose that there are two indifference curves IC_1 and IC_2 both intersect each other as they have been shown in the diagram. IC_1 is higher, IC_2 is lower IC. Therefore,

(i) Satisfaction at A = Satisfaction at C

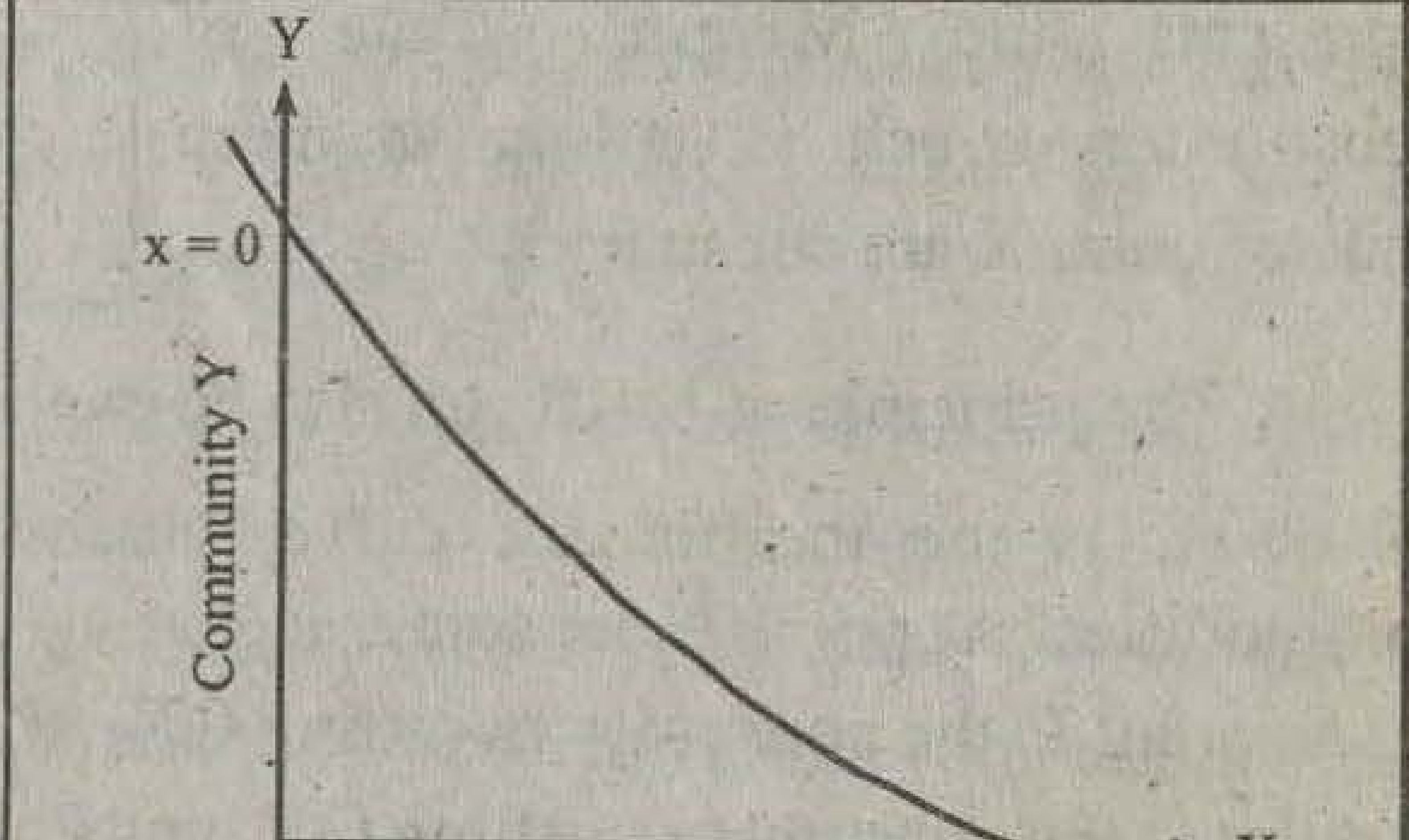
(ii) Satisfaction at A = Satisfaction at B

As per transitive rule if A = C and A = B then B should be equal to C. Whereas $C \neq B$ because 'C' point is on higher IC_1 and point 'B' is on lower IC_2.

(OR)

IC_1 and IC_2 are two indifference curves and both intersect each other at point A. Point B is situated on IC_2 shows low level of satisfaction and IC_1 shows high level of satisfaction. Point A is situated on both the indifference curves which shows that the satisfaction on points B and C (which is not equal) has become equal at point A. If two different indifference curves which give different satisfaction give equal satisfaction at a certain point it means there was actually no other indifference curve. Hence, the indifference curves do not intersect each other.

4. Do not Intersect or Touch either axis



Another property of indifference curve is that they do not intersect either x-axis or y-axis because if IC intersects x-axis or y-axis it shows one commodity model while IC is a representation of two commodity model as shown in the diagram. Because at x-axis commodity 'y' = zero and at y-axis commodity x is p zero.

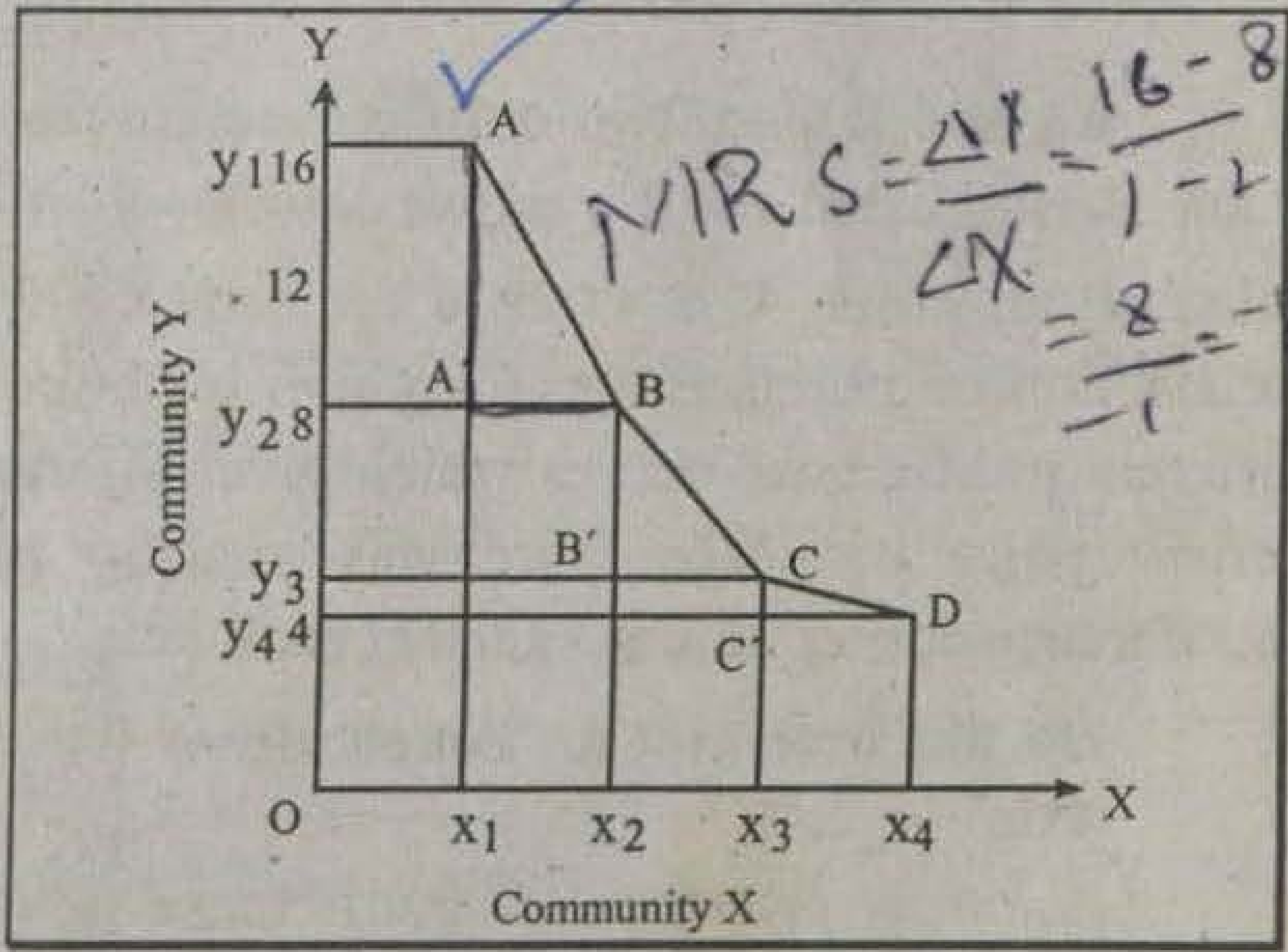
MARGINAL RATE OF SUBSTITUTION (MRS)

The concept of Marginal Rate of Substitution is an important tool of indifference curve technique. The Marginal Rate of substitution shows how much of one commodity is substituted for how much of another or it is rate at which a consumer is willing to substitute one commodity for the other in his consumption pattern. The concept of marginal rate of substitution (MRS) can be explained with the help of a schedule.

Combinations	Units of commodity (X)	Units of commodity (Y)	Marginal Rate of Substitution
A	1	16	–
B	2	8	8 : 1
C	3	5	3 : 1
D	4	4	1 : 1

It is clear from the table that consumer prefers one unit of commodity X and 16 units of commodity Y as he prefers two unit of commodity X and 8 units of commodity Y. He gives equal importance to all of the above combinations because all the combinations give him equal satisfaction. But the rate at which commodity X is being substituted is falling i.e., Marginal Rate of substitution is diminishing. This can be explained with the help of a diagram.

In the diagram units of commodity X have been measured on X-axis and units of commodity Y on Y-axis. If we join the points A, B, C and D which represent different combination of two commodities we get the indifference curve IC. The slope of the curve represents the Marginal Rate of Substitution which is falling as more units of com. X are consumed.



The principle of MRS can also be explained with the help of geometry.

IC is the indifference curve which represents different combinations of two commodities. At point A consumer is getting OX_1 units of com. X and OY_1 units of com. Y. At point B the consumer is getting OX_2 units of com. X and OY_2 units of com. Y and at point C the consumer is getting OX_3 units of com. X and OY_3 units of com. Y. At point D the consumer is getting Ox_4 units of Com. X and OY_4 units of Com. Y. At point D the consumer is getting Ox_4 units of com. X and Oy_4 units of com. y.

The Marginal Rate of Substitution at point B is:

$$MRS = \frac{OY_2 - OY_1}{OX_2 - OX_1} = -\frac{Y_2Y_1}{X_2X_1}$$

$$\text{or} \quad MRS = -\frac{AA'}{A'B} = \frac{\text{Perpendicular}}{\text{Base}} = \text{Slope} = 8 : 1$$

The Marginal Rate of Substitution at point C is:

$$MRS = \frac{OY_3 - OY_2}{OX_3 - OX_2} = -\frac{Y_3Y_2}{X_3X_2}$$

$$= -\frac{BB'}{B'C} = \frac{\text{Perpendicular}}{\text{Base}} = \text{Slope} = 3:1$$

the MRS at D is

$$MRS = \frac{OY_4 - OY_3}{OX_4 - OX_3} = -\frac{Y_4Y_3}{X_4X_3} = -\frac{CC'}{C'D} = \text{Slope} = 1:1$$

It is clear from the diagram that the slope of the curve at point B is less steeper than at point A and at point C it is less steeper than point A and B, which shows falling M.R.S.

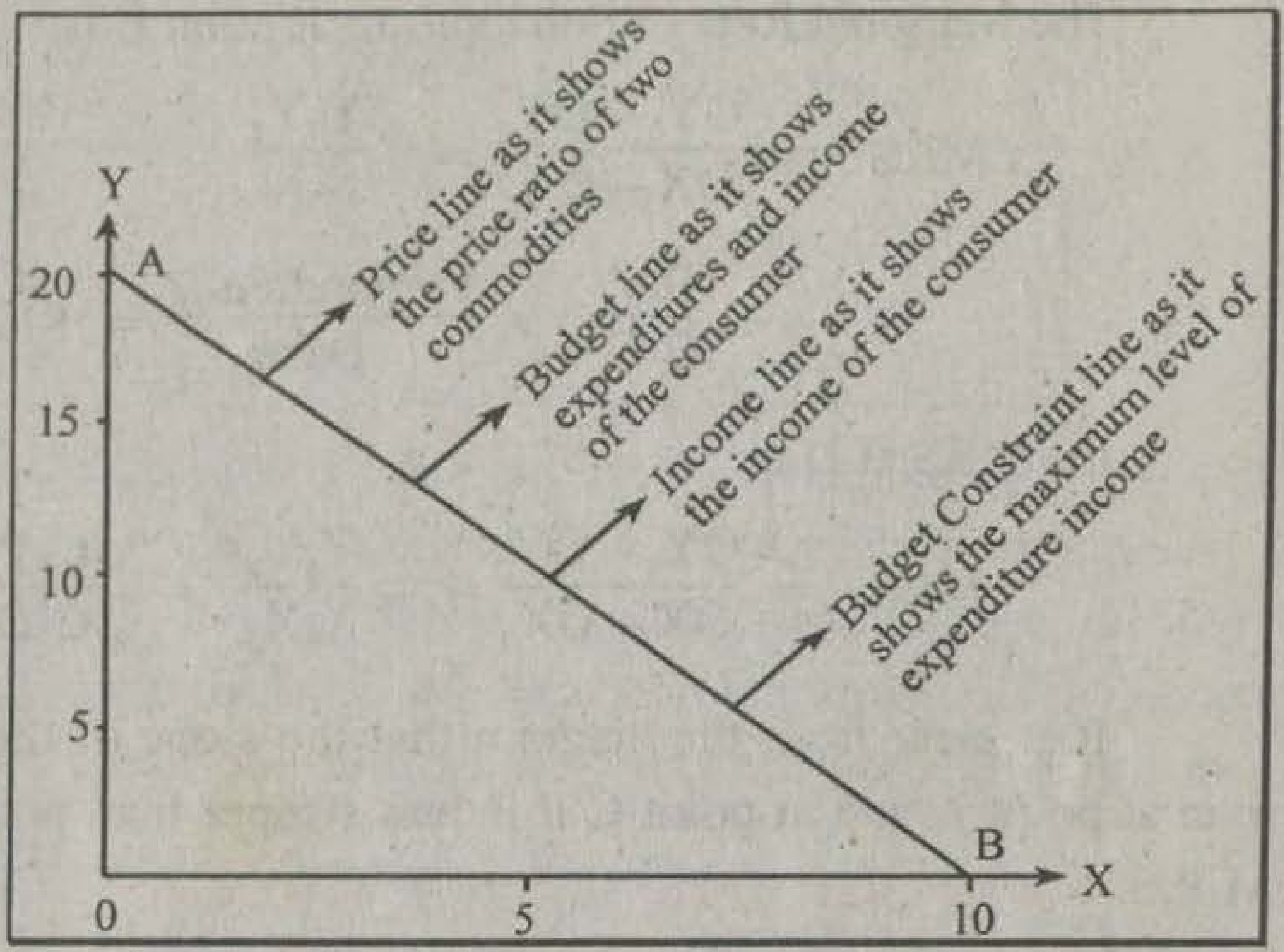
CONSUMER EQUILIBRIUM

An indifference curve is a locus of points. Each and every point on the indifference curve represents combination of two commodities and each combination gives equal satisfaction to the consumer. The consumer does not prefer one set of combination to another set of combination because he remains impartial. The slope of indifference curve shows the marginal rate of substitution. When a consumer substitutes one commodity for the other, marginal rate of substitution starts diminishing because the consumer is willing to give less and less units of that commodity whose quantity is decreasing for more and more units of the other commodity.

The higher indifference curve shows higher level of satisfaction and lower indifference curve shows lower level of satisfaction so that a consumer will try to reach at maximum possible highest indifference curve to get maximum satisfaction but the main hindrance is the level of income with which he wants to purchase different goods (which remains constant).

To understand that how a consumer reaches equilibrium position, we should understand the "price line" or income line or "Budget line" or "Budget constraint line". Suppose that a consumer has Rs. 100 at his disposal to spend on two commodities X and Y. Price of one unit of com. X is Rs. 5/= and price of one unit of com. Y is Rs. 10/=, so the consumer can either purchase maximum 20 units of com. X or 10 units of commodity Y with Rs. 100/=. Budget line has been drawn by joining these two possible points. In economics it is called the price line or income line or budget line.

AB is the price line, income line or budget-line which has been drawn by joining the points A and B. The slope of price line shows the price ratio of two commodities X and Y. If prices are given we can find the income of the consumer that is why it is called an income line.



The consumer is said to be in equilibrium when he obtains the maximum possible satisfaction from his purchases at the given prices. In order to explain how a consumer reaches equilibrium position we shall make the following assumptions.

1. Indifference Map

It is assumed that our consumer has an indifference map showing his scale of preferences for various combinations of two goods. The scale of preference remains the same throughout the analysis.

2. Constant Income

It is further assumed that the consumer has given and constant amount of money to spend on the goods and if he does not spend it on one commodity he must spend it on the other commodity.

3. Constant Prices

The prices in the market are given and constant and do not change through out the analysis.

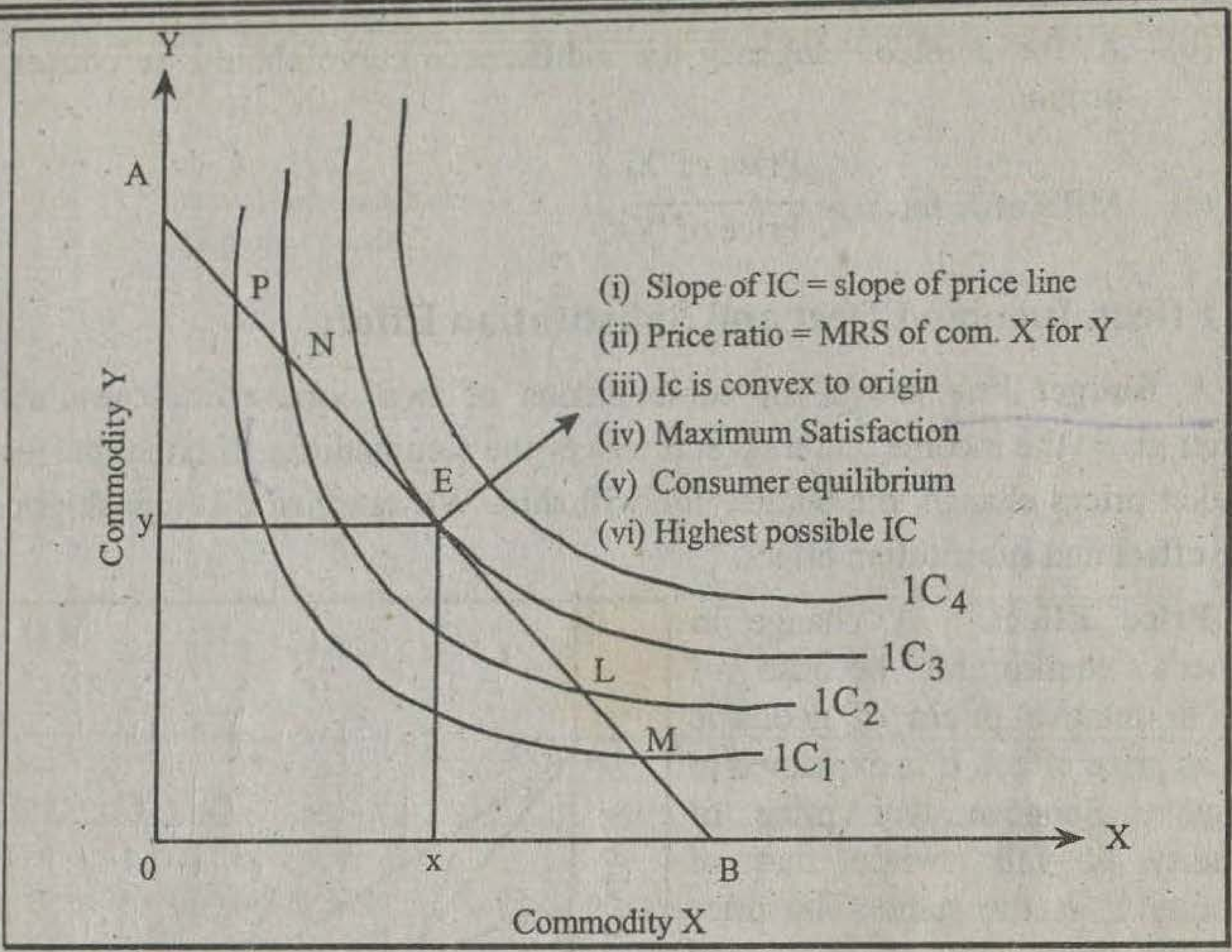
4. Goods are Homogeneous and Divisible

The goods which our hypothetical consumer is purchasing are homogenous and divisible.

5. Consumer acts Rationally

It is assumed that the consumer acts rationally and tries to maximize his satisfaction.

Consumer's Equilibrium can be shown with the help of a diagram.



Suppose that our hypothetical consumer has indifference map in his mind as it is shown in diagram and the price line facting the consumer is AB. The consumer will be in equilibrium position on any point on this price line AB because he can purchase only along this line, because his income does not allow him to move above this line. There are four indifference curves in the diagram which show indifference map of the consumer.

AB is the price line. In the diagram M.R.S. is equal to price line AB at points E, L, M, N & P. But our consumer will be in equilibrium position at point 'E' because the consumer is getting less satisfaction at points L, M, N and P than the point E with the same income because these points lie on lower indifference curves. The aim of the consumer is to maximise his satisfaction so he will be in an equilibrium position at point E. At E, the slope of indifference curve represents MRS and slope of price line represents price ratio, at the point of tangency both are equal. Therefore, our consumer is getting maximum satisfaction, the MRS of com. X for Y is equal to the price ratio of com. X for Y. At the point of tangency the MRS is also falling.

We can conclude that two necessary conditions of consumer's equilibrium are as follow:

(a) That price line becomes tangent to indifference curve or MRS of two commodities is equal to their price ratio.

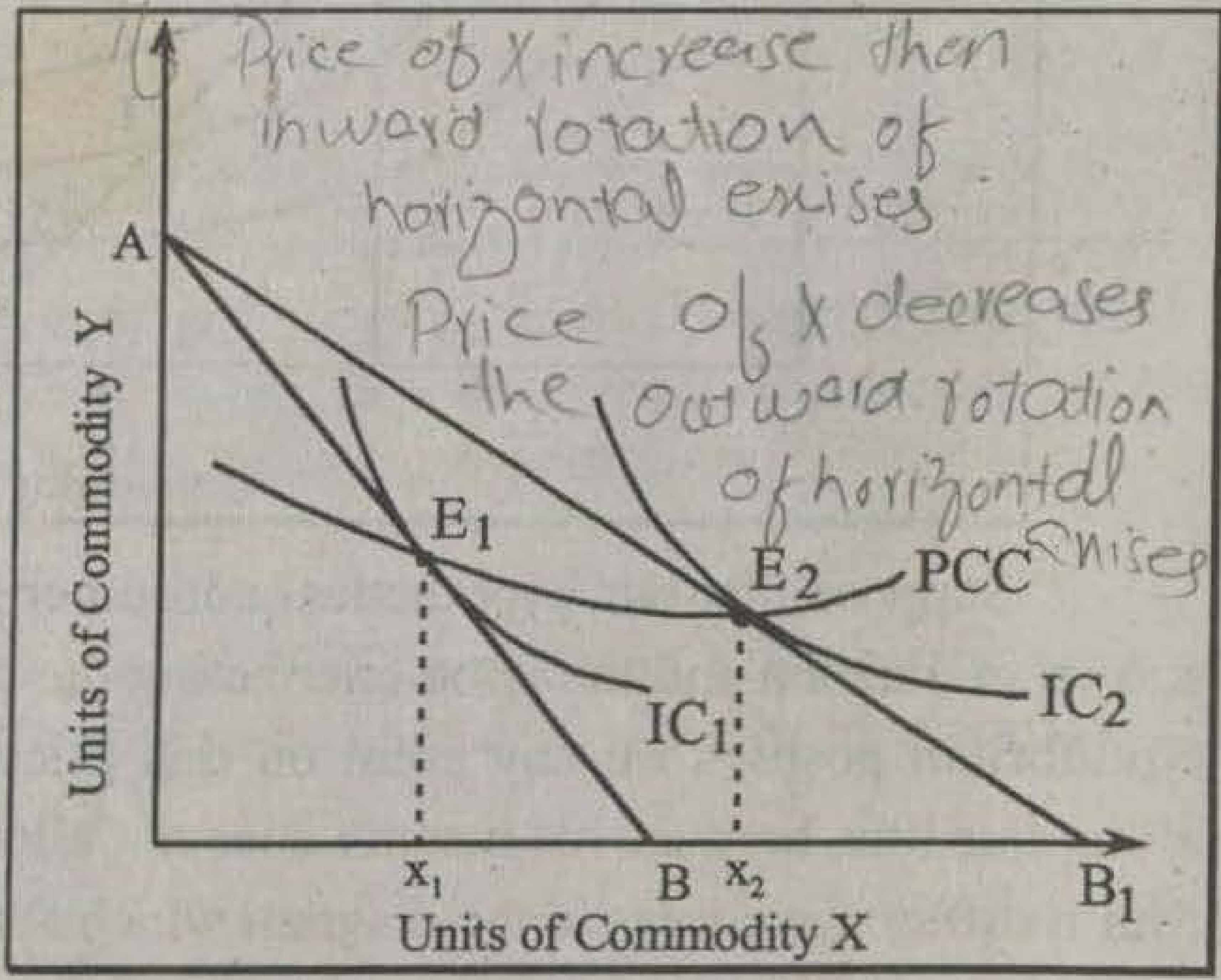
(b) At the point of tangency the indifference curve should be convex to the origin.

(c) $\text{MRS of X for Y} = \frac{\text{Price of 'X}}{\text{Price of 'Y}}$

Price Effect, Income Effect and Substitution Effect

1. **A Budget line** shows all combinations of two commodities available to a consumer given the income and market prices of the commodities. If either the income or the market prices change, the budget line will shift. We can then distinguish price effect income effect and substitution effect.

A. Price Effect: A change in consumer's equilibrium because of change in relative prices of goods is known as price effect. It is explained in the figure. Suppose that price of commodity X falls while that of commodity Y is the same. The price line shifts from AB to AB_1 and consumer reaches to higher IC_2. The shifting of consumer's equilibrium from E to E_1 is known as price effect. In price effect consumer reaches to new budge line and new indifference curve.



Different Situations of Price Effect

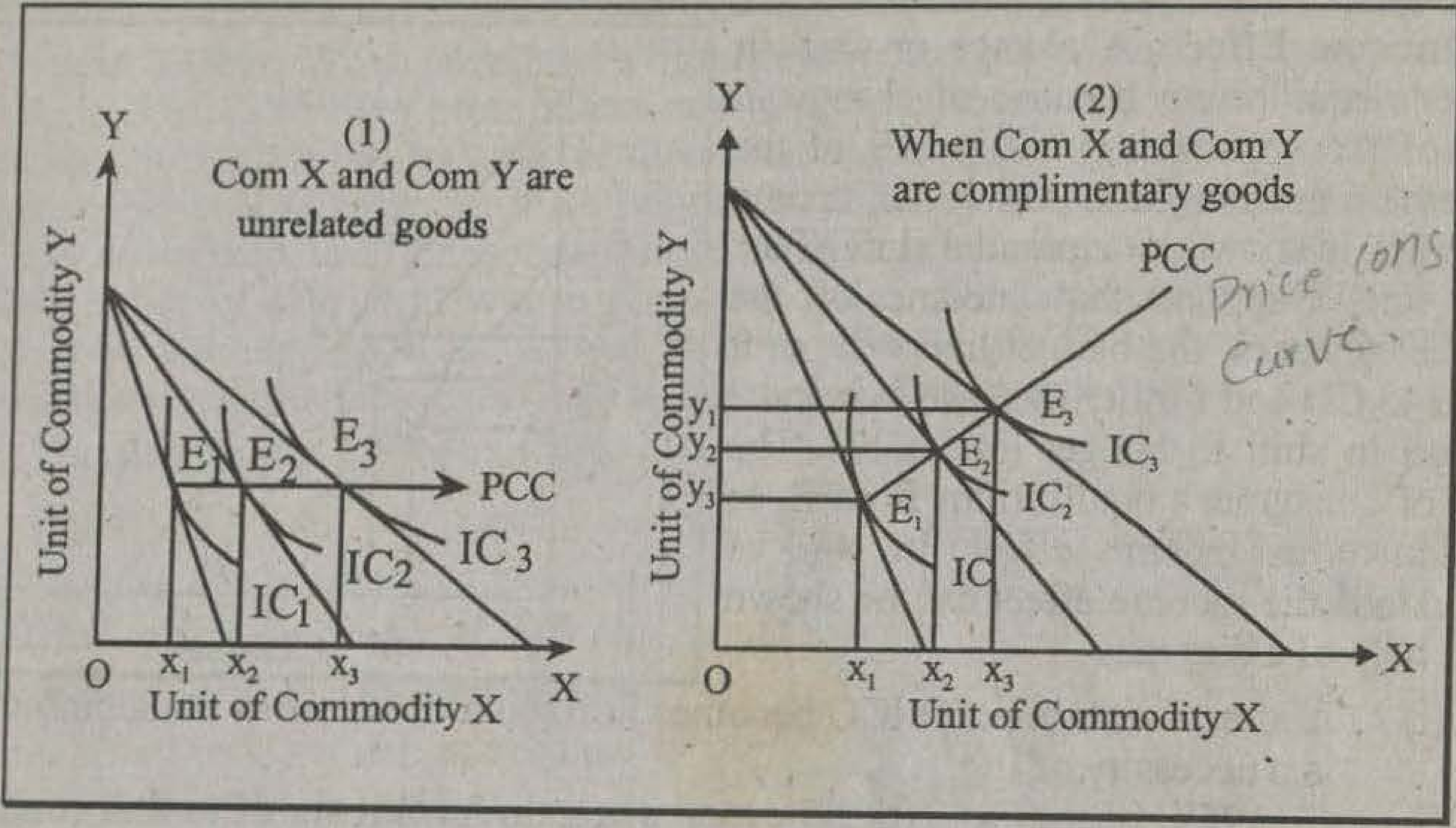
1. If the price consumption curve is horizontal which means commodity X and commodity Y are unrelated goods.

2. If the price consumption curve slopes upward, commodity X and commodity Y are complementary goods.

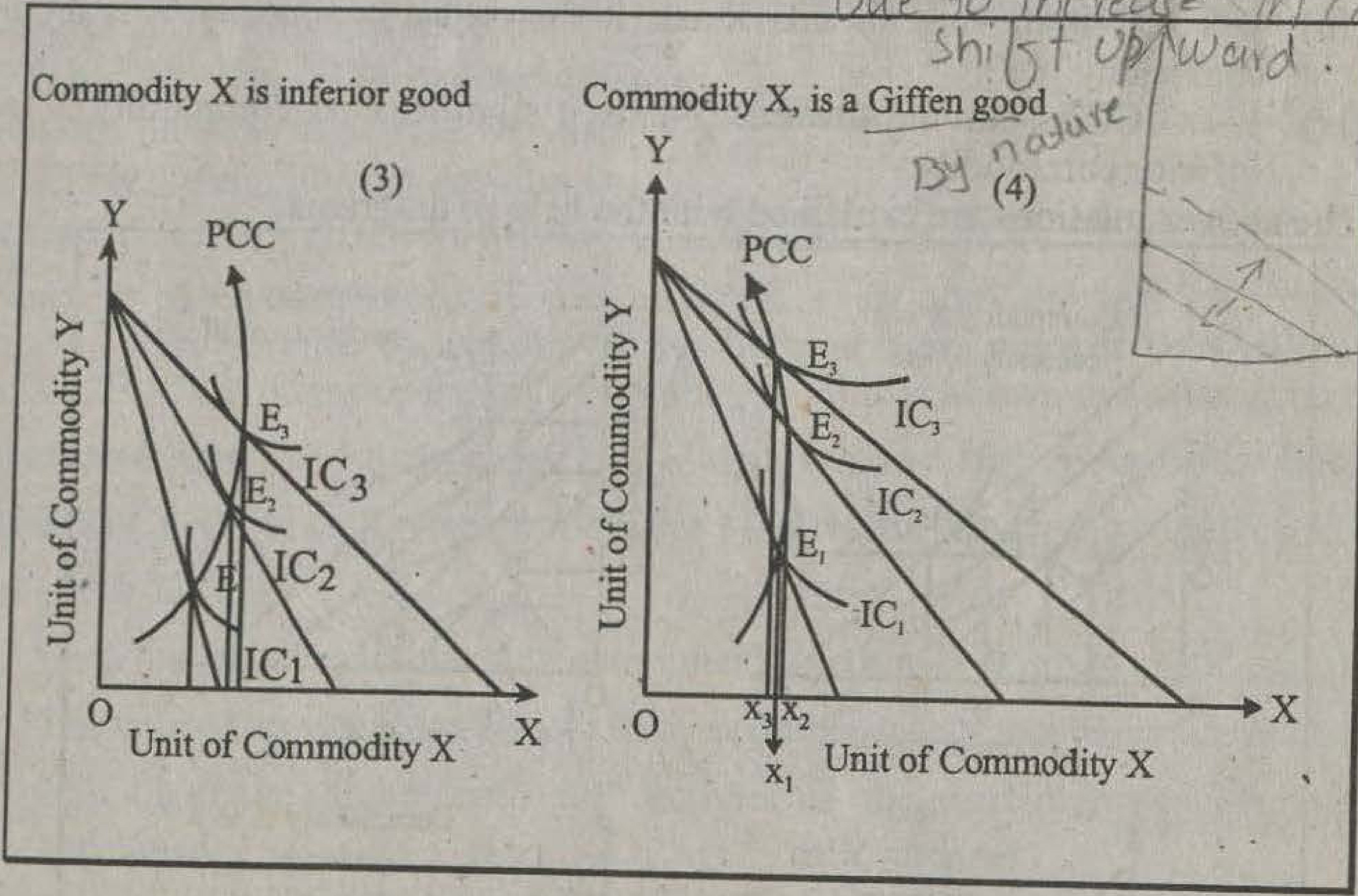
3. If PCC is moving towards y-axis it signifies that commodity X is an inferior commodity.

4. If PCC is backward sloping towards the y-axis which means commodity X is a Giffen good.

The above situations can be explained with the help of diagrams:

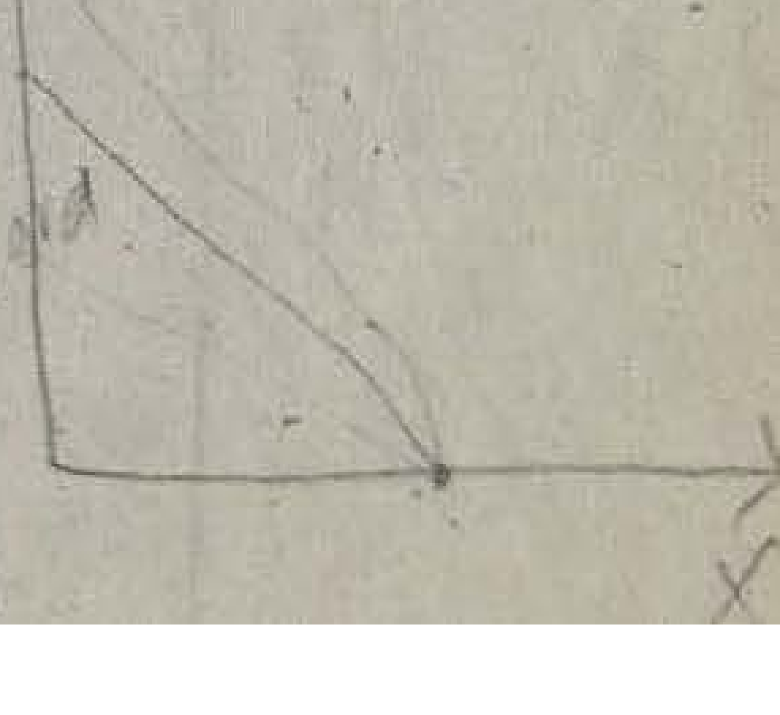


Due to increase in come B C shift upward.

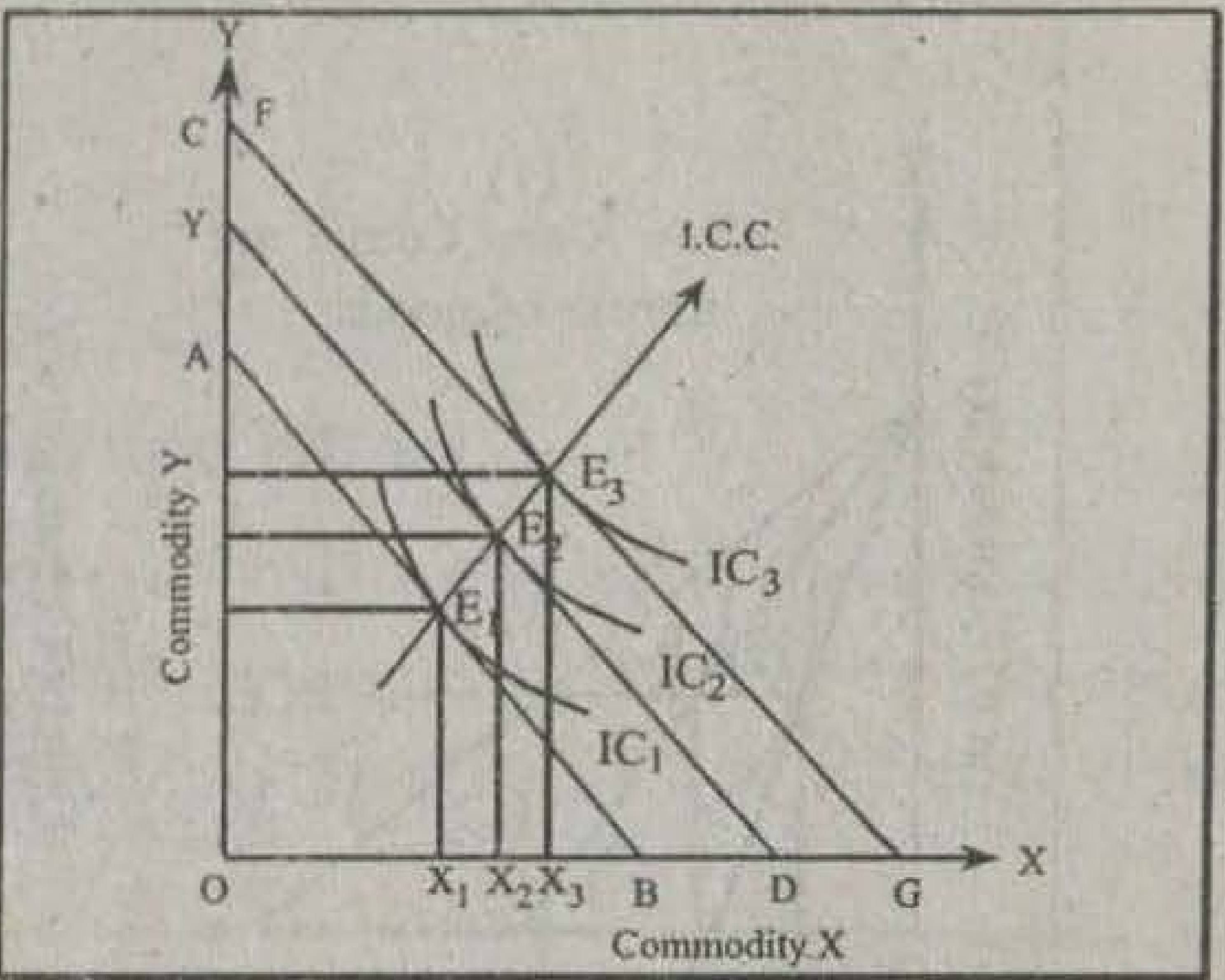


Py Increases downward rotation on Y vertical anises

Py decreases upward rotation on py vertical anises



B. Income Effect: A change or shift in consumer's equilibrium because of change in income of the consumer while prices of the goods remain unchanged is known as income effect or I.E. is shown by a parallel shift of the Budget line. Suppose that income of the consumer increases, the budget line will shift from AB to CD and further increase in income will result in shift in budget line to FG. The shifting of consumer's equilibrium from E_1 to E_3 is known as income effect. In case of normal goods the income effect can be shown with the help of a diagram.



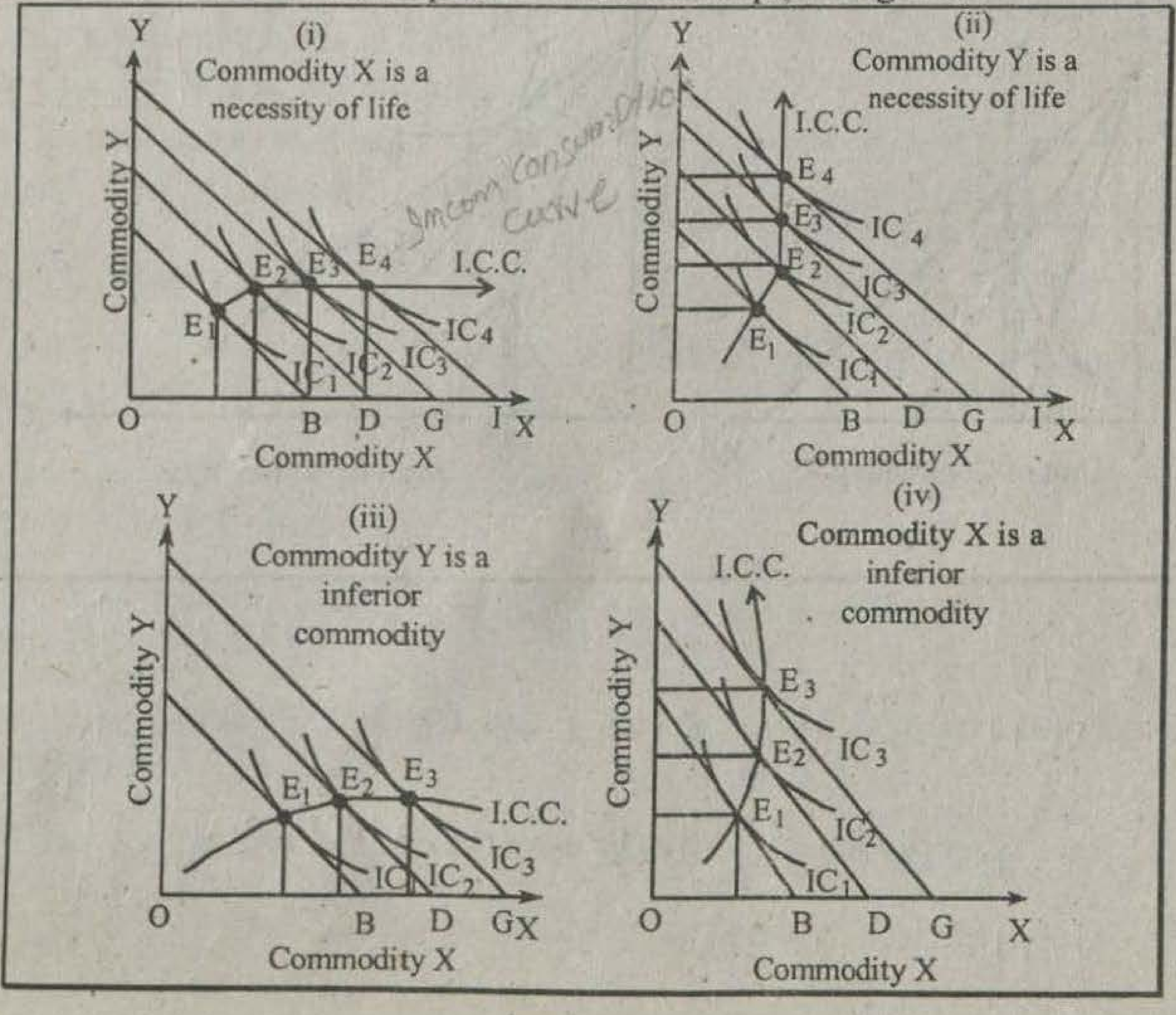
(i) If after a certain point ICC becomes horizontal it signifies that commodity X is a necessity of life.

(ii) If an ICC becomes vertical beyond a certain level it signifies that commodity Y is a necessity of life.

(iii) If a ICC is moving towards X-axis it shows that commodity Y is an inferior commodity.

(iv) If an ICC is moving towards Y-axis it signifies that commodity X is a an inferior commodity.

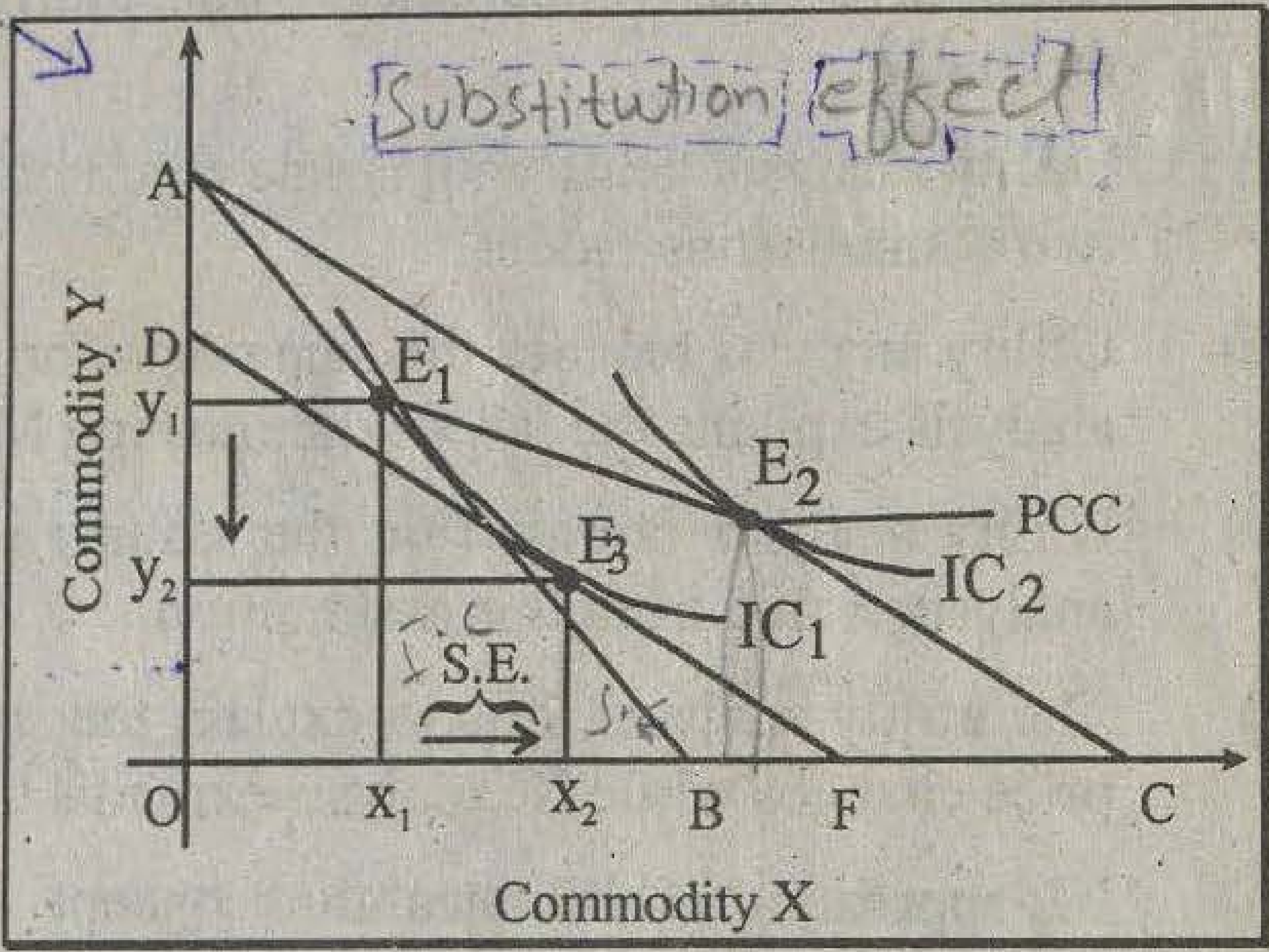
The above situations are explained with the help of diagrams:



Note: Income effect is shown by a parallel shift of the budget line.

Substitution Effect: When consumer's equilibrium changes because of change in relative prices of goods it is called price effect and if price changes but the consumer's income also changes in such a way as to leave their total utility unchanged the quantities of goods consumed will still change; because consumer will buy more of goods whose relative price, has fallen and less the goods whose relative price, has risen. When a consumer purchases more of the good whose price has fallen and has become more cheaper to relative good although increase in real income because of fall in price of good 'X' has been withdrawn is known as substitution effect or sliding over the same I.C.

The substitution effect can be shown with the help of a diagram:



Before a fall in price of commodity X, the consumer was in equilibrium at E_1, because of fall in price of commodity X, the equilibrium position shifted to E_2 which is because of price effect. If increase in real income because of fall in price of commodity X is withdrawn as shown by DF budget line. The consumer's equilibrium moves backward to the lower IC but the equilibrium position is E_3 instead of E_1 which shows that the consumer is purchasing more of commodity X even after the real income has been withdrawn. It is because commodity X has become more cheaper than commodity Y. Therefore, less will be purchased of commodity Y. This is known as substitution effect.

Comparative Study of Indifference Curve Analysis and Utility Analysis (OR)

Ordinal Vs Cardinal or Two Commodities Model with Single Commodity Model

Points of Similarities

(i) Both the analysis assume that **consumer's income** is given to spend on goods.

(ii) The taste of the consumer in both analysis during consumption remains unchanged.

(iii) The objective under both the analysis is the maximum satisfaction of the consumer.

(iv) The consumers behave rationally.

(v) The equilibrium condition of the consumer under both the analysis is the proportionality rule e.g., in utility analysis equilibrium condition is

$$\frac{\text{MU of X}}{\text{MU of Y}} = \frac{\text{Price of X}}{\text{Price of Y}}$$

and in IC approach the equilibrium condition is MRS = X for Y = $\frac{\text{Price of X}}{\text{Price of Y}}$

(vi) Utility analysis assumes diminishing marginal utility and indifference curve analysis assumes diminishing MRS.

(vii) In both the analysis price of goods are assumed to be unchanged during consumption process.

(viii) Divisibility of goods is another similarity in both approaches.

Points of Differences

(i) Utility analysis assumes that utility is a cardinally measurable quantity i.e., utility is additive and comparable. While indifference curve analysis measures utility ordinally.

(ii) Utility analysis deals with single commodity model while IC approach deals with two commodities model.

(iii) Utility analysis reaches the same equilibrium with unrealistic assumptions and IC analysis explains the law of diminishing MRS without unrealistic assumptions.

(iv) Utility analysis is based on the assumption of constant MU of money while IC analysis is free from this assumption.

(v) The utility analysis fails to explain the income effect and substitution effect of a price changes while IC analysis explains these successfully.

(vi) IC approach rehabilitates the concept of consumer's surplus. It explains the concept without the unrealistic assumption of constancy of MU of money.

CRITICISM ON INDEFFERENCE CURVE ANALYSIS

1. Old Wine in a New Bottle

IC analysis only substitutes the concept of preference for utility. It adopts on ordinal analysis instead of cardinal analysis.

2. Away from Reality

Although it is based on few assumptions yet it is not even nearer to the truth.

3. It fails to explain the observed behaviour of the consumer. The MRS cannot be discovered from market data.

4. Mid Way House

Indifference curves are hypothetical because these are not subject to direct measurement. According to Schumpepter "IC approach is practically no better off than utility function.

5. Irrational Consumer

The theory is based on the assumption of rational behaviour of the consumers but practically they do not always showing rational behaviour.

6. **Combination of Two Goods**

Combination of two goods are not based on any principle as they often become Abcurd e.g., there is no combinations of shoes & shirts, T.V. Set & Refrigerator.

7. **Incorrect assumption of two Commodity model**

The combination of two goods model makes the theory unrealistic because the consumer is purchasing larger quantities to satisfy his unlimited wants.

8. The theory fails to explain the consumer's behaviour in involving risk or uncertainty.

9. **Perfect Competition**

The analysis is based on the assumption of perfect competition and homogeneity of goods whereas the condition of perfect competition does not exist as oligopoly markets are now prevailant.

10. **Indivisibity**

It is crticised that all the goods purchased by the consumer are not divisible e.g., watch, T.V. sets, computer etc., indivisible.

CONSUMER SURPLUS

The concept of consumer surplus is very important and useful in Economics and it has both theoretical and practical importance. The concept of consumer surplus was introduced, developed and explained by Alfred Marshall in his book "The Principles of Economics". Alfred Marshall derived the concept from the basic and fundamental law of consumption known as Law of Diminishing Marginal Utility.

In our ordinary purchases there is some consumer's surplus since we may be prepared to pay move than we actually pay for a commodity. Thus consumer surplus is the extra utility that we gain from the consumption of commodity over the price that we pay for the commodity. The gap between the total utility of a commodity and its total market value is called consumer surplus.

TECHNICAL DEFINITION

According to Alfred Marshall "the excess of the price which the consumer would be willing to pay rather than go without the thing over that which he actually does pay is the economic measure of this surplus satisfaction and it is called consumer surplus."

According to Kout Soynnis "consumer surplus is equal to the difference between the amount of money that consumer actually pays to buy a certain quantity of commodity and the amount he would be willing to pay for this quantity of commodity and the amount he would be willing to pay for this quantity rather than do without it."

According to Watson "the difference between the amount a consumer would be willing to pay for the quantity of a commodity he buys and the amount that he actually does pay is called consumer surplus."

According to Samuelson "The gap between the total utility of a commodity and its total market value is called consumer surplus."

In short, consumer surplus is what we are prepared to pay minus what we actually pay for a commodity consumed. Alfred Marshall pointed out that consumer surplus exits in many commodities which are highly useful but are very cheap. Such commodities include post cards, news papers, match box, salt, soap, telephone calls, SMS, hair pins, dry cells etc.

ASSUMPTIONS OF CONSUMER SURPLUS

(i) Law of Diminishing Marginal Utility

The concept of consumer surplus is derived from the law of diminishing marginal utility because as the consumer consumes more and more units of a commodity the marginal utility of successive units starts diminishing.

(ii) Given Income

It is also assumed that the consumer has a given and fixed income and it does not change during the process of consumption.

(iii) Perfect Market

While measuring and calculating consumer surplus we assume a perfect market which means that same price prevails for all the units in the market.

(iv) No Substitute for the Commodity

We also assume that there is no substitute of the commodity.

(v) Marginal Utility of Money is Constant

The concept of consumer surplus is also based on the assumption that the marginal utility of money remains constant which means that as we spend more and more units of money, its marginal utility does not change.

(vi) There is no change in the taste of consumer:

It is also assumed that during the consumption of the commodity consumer's taste does not change.

CONSUMER SURPLUS THROUGH CARDINAL UTILITY APPROACH

In order to explain the concept of consumer surplus let us suppose that a consumer start consuming various cups of ice cream and pays Rs. 10/- as price for each cup consumed. When the consumes 1st cup of ice cream he gains maximum utility and as he consumes more and more cups of ice cream, marginal utility of additional and successive cups starts diminishing due to the application of law of diminishing marginal utility.

Sooner a point would reach where the marginal utility of ice cream will become equal to the price paid by the consumer. Thus the consumer will purchase as many cups of ice cream as make his marginal utility equal to the price. At this point the consumer will gain maximum surplus. If the consumer consumes more cups beyond this point then the consumer surplus will become negative because now the marginal utility of ice cream will be less than the price paid by the consumer. This position is explained with the help of the following table.

Presentation by table or schedule

Cups of ice cream	Marginal utility worth	Price	Consumer surplus
1^{st}	16	Rs. 10	6 (16 – 10)
2^{nd}	14	10	4 (14 – 10)
3^{rd}	12	10	2 (12 – 10)
4^{th}	10	10	0 (10 – 10)
5^{th}	8	10	–2 (8 – 10)

In the above table it is clear that as the consumer purchases and consumes the 1^{st} cup of ice cream, the consumer derives utility equal to Rs. 16 and he is prepared to pay Rs. 16 rather than go without it. However, the consumer actually pays Rs. 10/- as it price and, therefore, he gains consumer surplus equal to Rs. 6 (16 – 10). Similarly when the consumer consume the 2^{nd} cup of ice cream, he gains marginal utility worth Rs. 14/- but pays Rs. 10/- as its price and, therefore, he gains surplus equal to Rs. 4 (14 – 10). Likewise as the consumer consumes 3^{rd} cup of ice cream, he gains utility worth Rs. 12 but pays Rs. 10 as its price. Thus the consumer gains surplus worth Rs. 2 (12 – 10).

Now when the consumer consume the 4^{th} cup of ice cream, marginal utility becomes equal to its price and therefore consumer gains no surplus or zero surplus from the consumption of 4^{th} cup. Thus the consumer surplus is equal to 0(10 – 10). A rational consumer will stop consuming more cups of ice cream and gain maximum consumer surplus by consuming only four cups of ice cream. The total consumer surplus from the consumption of four cups amounts to $\boxed{12}$ (6 + 4 + 2 + 0).

Formula for Calculating Consumer Surplus 4 Cups Consumed

(i) Consumer surplus = TU – Total amount spent

Consumer surplus = 16 + 14 + 12 + 10 – 40 = 52 – 40 = $\boxed{12}$

(ii) Consumer surplus = TU – Price × Units consumed

Consumer surplus = 16 + 14 + 12 + 10 – 10 × 4 = 52 – 40 = $\boxed{12}$

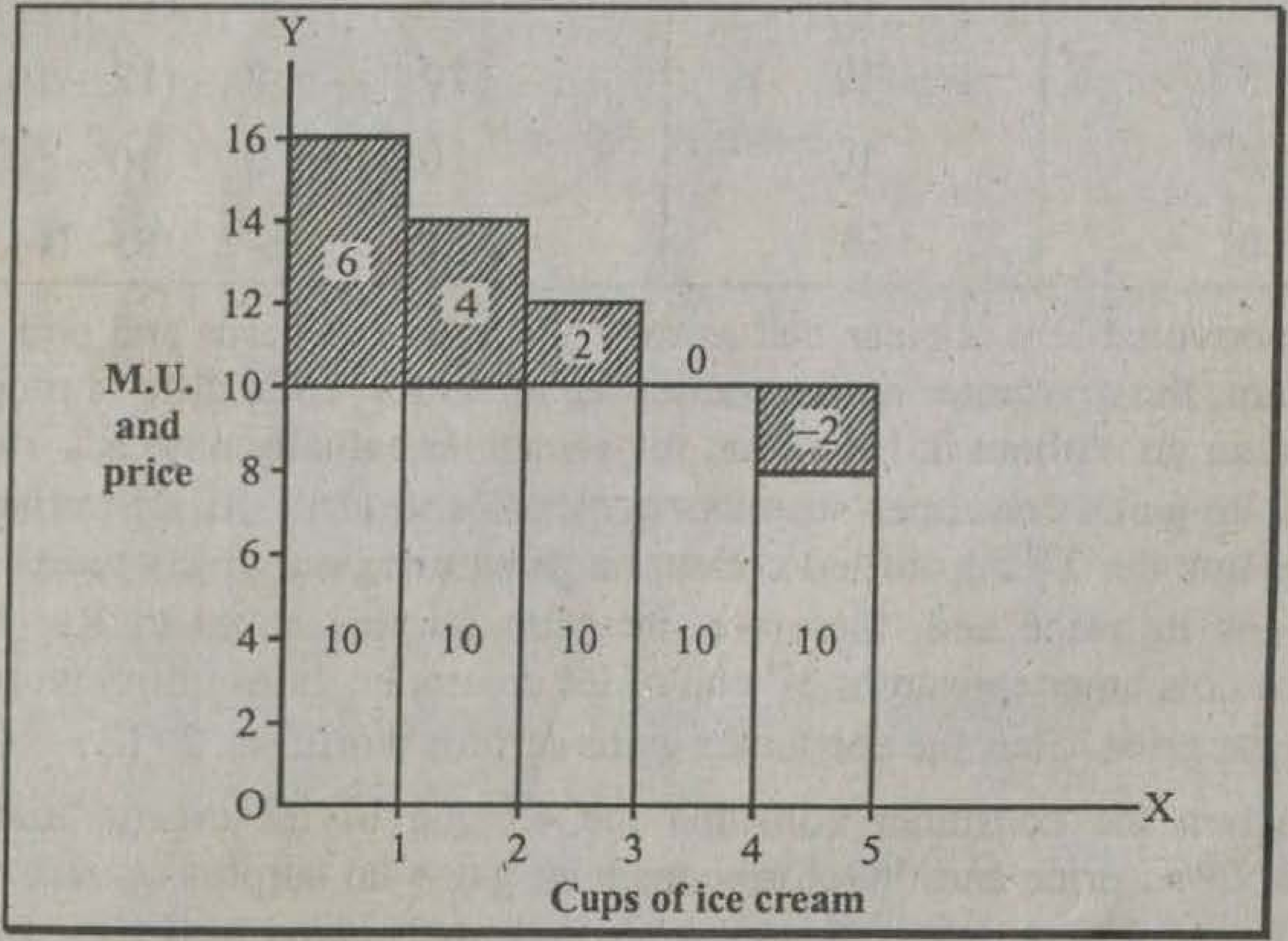
Now if the consumer consumes 5^{th} cup of ice cream, the consumer surplus becomes negative shown as –2 because the utility gained from the consumption of 5^{th} cup of ice cream is less than the price paid by the consumer (10 – 12) = –2. Similarly if the consumer consumes five cups of ice cream the total consumer surplus will be reduced from 12 to 10 (6 + 4 + 2 + 0 – 2).

Consumer Surplus when 5 Cups Consumed

$$\text{Consumer surplus} = 16 + 14 + 12 + 10 + 8 - 10 \times 5$$
$$= 60 - 50 = \boxed{10}$$

PRESENTATION OF DIAGRAM

The concept of consumer surplus as explained in the above table or schedule can also be presented with the half of the following diagram.



In the above diagram it is clear that MU and price of various cups of ice cream is presented on y-axis and units of ice cream consumed are shown on x-axis. It is also shown that when the consumer consumes 1^{st} cup of ice cream he gains utility worth Rs. 16/- and he is ready to pay this price rather than go without it. But the consumer pays Rs. 10/- as its price and therefore gains surplus equal to Rs. 6 (16 – 10). Similarly when the consumer consumes the 2^{nd} cup of ice cream, he gains utility worth Rs. 14/- but pays Rs. 10/- as its price and thus gains surplus equal to Rs. 4 (14 – 10). Likewise when the consumer consumes the 3^{rd} cup of ice cream he gains utility worth Rs. 12/- and is prepared to pay this price but the consumer actually pays Rs. 10/- as its price and therefore the consumer gains surplus worth Rs. 2 (12 – 10). Now when the consumer consumes 4^{th} cup of ice cream, the utility of 4^{th} cup consumed becomes equal to its price

and therefore the consumer surplus becomes 0 (10 – 10). Thus a rational consumer will consume only four cups and gain maximum total consumer surplus equal to Rs. 12 (6 + 4 + 2 + 0). Thus the consumer surplus of four cups consumed will be as following:

(i) Consumer surplus = Total utility – Total amount spent

Consumer surplus = 16 + 14 + 12 + 10 – 40

= 50 – 40 = $\boxed{12}$

(ii) Consumer surplus = Total utility – Price × Units consumed

= 16 + 14 + 12 + 10 – 10 × 4

= 52 – 40 = $\boxed{12}$

Thus under the assumption of rationality a consumer will consume only four cups and gain maximum surplus. Suppose the consumer is not rational and consumes the 5^{th} cup of ice cream then the consumer surplus will become negative shown as –2 (10 – 12) and the total consumer surplus will be reduced from 12 to 10 (6 + 4 + 2 + 0 – 2) and it will not be maximum.

CRITICISM

In the above we have explained consumer's surplus is simply the difference between what we are prepared to pay rather than go without and what we actually pay. However, the measurement of consumer surplus is not so simple. There are many difficulties which stand in the way of the precise measurement of consumer surplus. The concept of consumer surplus has been criticised on the following grounds.

1. Measurement of Utility

The concept of consumer surplus as advocated by Alfred Marshall is based on the cardinal and quantitative measurement of utility. According to modern economists like Hicks, Allen utility is a psychological are intangible concept and it cannot be measured in quantitative units. Since the concept of consume surplus is based on the measurement of utility, therefore, it is incapable of numerical measurement.

2. Hypothetical and Imaginary

It is also pointed out that the concept of consumer surplus introduced by Alfred Marshall is hypothetical, imaginary and illusory. It is very difficult to say what a consumer will be ready to pay rather than go without the thing. The surplus is measured through illusion and imagination and it does not exist in practical life.

3. Necessities of Life

In case of necessities and conventional necessities the consumer surplus has no application because in such cases the consumer will be ready to pay any amount rather than go without. Thus the utility is infinite.

4. Marginal Utility of Money

Marshallian concept of consumer surplus is based on the wrong assumption of constant marginal utility of money. As we go on buying a commodity, less and less amount of money is left with us. Hence the marginal utility of each unit of money increases.

5. Relative Concept

The concept of consumer surplus is relative and not fixed or absolute. Consumer surplus is defined as the difference between the price that the consumer is willing to pay and the price that he actually does pay. Now if the price of a commodity rises then the consumer surplus will be reduced and in some cases consumer surplus may disappear at all.

6. Assumption of Independent Utilities

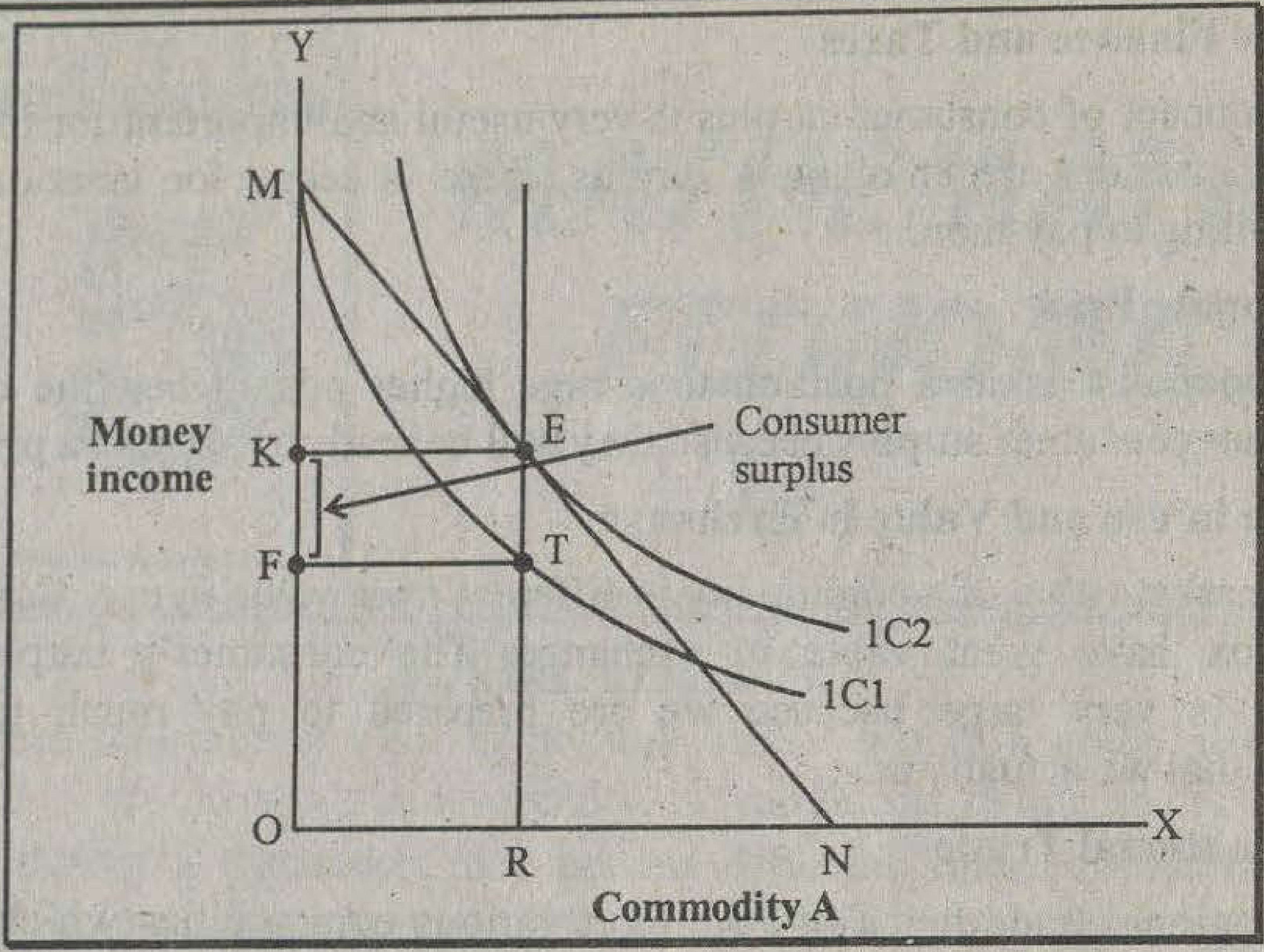
Marshallian concept of consumer surplus is based on the assumption that the utilities derived from various commodities are independent. This is unrealistic and wrong assumption because in practical life the utilities derived from various commodities are interrelated and interdependent.

7. Consumer's Income

Income of the consumer also affect consumer surplus. Some consumers are rich while others are poor. A rich man is prepared to pay much more for a thing rather go without it. This difference in consumer's income makes the measurement of consumer surplus difficult and inexact. Marshallian concept of consumer surplus ignores this fact.

CONSUMER SURPLUS THROUGH ORDINAL UTILITY APPROACH

Prof. Hicks severely criticized Marshallian concept of consumer surplus and reliabilited the concept of consumer surplus by approaching it in terms of ordinal utility function or indifference curve technique. He has presented a measure of consumer surplus without assuming utility to be measurable and the marginal utility of money to be constant. According to Prof. Hicks "consumer surplus is the difference between marginal valuation of a unit and the price which is actually paid for it." Thus Prof. Hicks advocated that consumer surplus is a monetary gain to the consumer which is due to a fall in the price of accommodity. According to Prof. Hicks the consumer can purchased more quantity of a commodity with a fall in its price OR he can purchase the same quantity of that commodity saving of money income due to fall in the price of commodity. The concept of consumer surplus through Hicksian approach is presented with the help of the following diagram.



In the above diagram it is clear that money income of the consumer is shown on y-axis and the amount of commodity A on x-axis. Let us assume that the consumer does not know the price of commodity A. The consumer has a given income shown as OM. Indifference curve 1C1 originates from point M showing various combination of money income and commodity A. Point T on 1C1 shows that the consumer purchases OR quantity of commodity A and is ready to pay MF amount of money income. Now suppose that the consumer knows the price of commodity A and therefore MN is the budget line of the consumer which shows that the consumer is in equilibrium at point E where the budget line of the consumer is tangent to 1C2. Now the consumer purchases ON quantity of commodity A and sacrifices MK amount of money income. Thus when the consumer was not aware of the price he was really to pay MF amount of money which was more than the actual amount of money paid MK. Thus the difference between the two MF – MK represents consumer surplus shown as KF.

IMPORTANCE OF CONSUMER SURPLUS

Although incapable of precise measurement, the concept of consumer surplus has great practical utility and theoretical importance.

1. Conjunctural Importance

Consumer surplus enables and helps us to compare the benefits of environment and opportunities or conjunctural advantages. Consumer surplus enables to compare the economic conditions of the people at different places and times. The larger the consumer's surplus the better off are the people.

2. Public Finance and Taxes

The concept of consumer surplus is very useful and important for imposing taxes. Where the consumers are enjoying a surplus, there is scope for taxation because the people are willing to pay more.

3. Monopoly Price

A monopolist is in a position to charge higher price when the consumers are enjoying higher consumer surplus because they will be ready to pay extra price.

4. Value in use and Value in Exchange

The market value of a commodity is different from value in use. Commodities like salt, matchbox have great value in exchange. The consumer's surplus from such commodities is very large because we are prepared to pay much more for such commodities that we actually pay.

5. International Trade

International trade helps us to import various commodities which happen to be cheaper. Before we imported them, we were paying more for similar commodities. They yield a surplus satisfaction which is measured by the excess of what we have paid for them over what we have actually paid. The larger this surplus, the more beneficial is international trade.

6. Public Utilities

The govt. provides public utilities to the people in the form of gas, electricity, water supply, transport and communications. The consumers benefit more from such utilities and pay a less price than they are willing to pay. The enjoy consumer surplus.

7. Government Subsides

The concept of consumer surplus is very helpful and useful for govt. subsidies. The govt. imposes taxes on these industries which are operating under law of increasing returns and provides subsidies to those industries which are operating under law of diminishing returns.

8. Cost Benefit Analysis

The concept of consumer's surplus is very useful in working out cost benefit analysis of an investment. We have to weigh the costs and benefits. The larger the consumer's surplus more beneficial is considered the investment. Thus the concept of consumer's surplus is a useful tool for the formulation of important economic policies.

9. Economic Development and Welfare

Those countries are developed and advanced in which people enjoy more consumer surplus. The concept of welfare state is based on the maximum consumer surplus available to the people. The magnitude of consumer surplus is useful to draw the line between rich and poor nations.

Measurement of elasticity of demand with the help of average formulae elasticity of demand is as below:

The formula to measure arc elasticity of demand is as follows:

$$\text{Elasticity} = \frac{Q_1 - Q_0}{Q_1 + Q_0} \times \frac{P_1 + P_0}{P_1 - P_0}$$

Where Q_0 is the original quantity demanded and Q is the new quantity demanded. P_0 is the original price and P_1 is the new price.

If following is the schedule of demand, elasticity of demand can be measured with the help of above formula.

Price Per Kg.	Quantity Demanded (Kg.)
10 —— P_0	100 —— Q_0
5 —— P_1	300 —— Q_1

By putting the values in the above formula we get.

$$E = \frac{300 - 100}{300 + 100} \times \frac{5 + 10}{5 - 10}$$

$$E = \frac{200}{400} \times \frac{15}{-5}$$

$$E = -1.5$$

$$E > 1 \text{ i.e., elastic.}$$

Note: Point elasticity of demand is measured on a single point on a demand curve while arc elasticity of demand is measured between two points on a demand curve.

4. Geometrical Method

If we measure elasticity of demand on a single point on the demand curve it is geometrical method. Elasticity on a demand curve is different at different points it may be greater than unity, less than unity and equal to unity.

The formula to measure elasticity of demand is:

$$E = \frac{\text{Lower part of the demand curve}}{\text{Upper part of the demand curve}}$$

Elasticity on a demand curve can be explained with the help of a following diagram. Suppose that the demand curve is a straight line slopping downward.

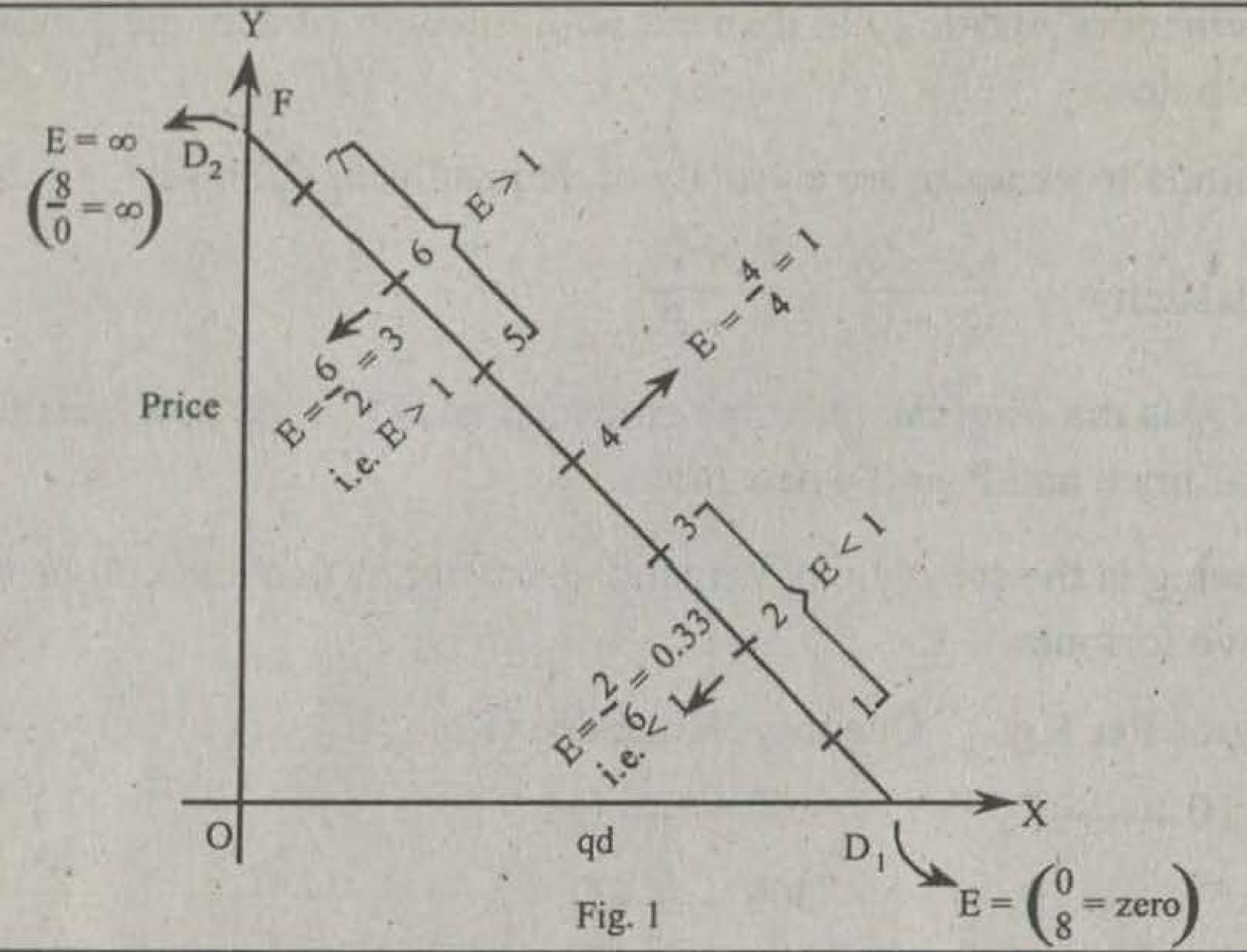


Fig. 1

In the diagram D_1D_2 is a demand line which has been subdivided into 8 equal parts. Elasticity at 4 is equal to unity because the lower part in 4 and upper part is also 4. So E = 4/4 = 1. Elasticity at point 1, 2 & 3 is less than unity because lower point is smaller than the upper part e.g., elasticity at 2, $E = \frac{2}{6} = \frac{1}{3} = 0.33$. which is less than unity. Elasticity at points 5, 6 & 7 is greater than unity because lower part is greater than the upper part e.g., elasticity at 6 is, $E = \frac{6}{2} = 3$ i.e., greater than unity.

We may conclude that elasticity on the mid point on a demand curve is unit elastic and elasticity at points below mid point is inelastic and at points above the mid point is elastic. Elasticity at D_1 is, $E = \frac{0}{8} =$ zero and elasticity at D_2 is, $E = \frac{8}{0} = \infty$ (infinity) which means that elasticity along X-axis is perfectly inelastic and along Y-axis is perfectly elastic. (This is the reason that demand curve never touches either X-axis or Y-axis because it negates the law of demand).

If the demand curve is not a straight line even then the above formula applies. Elasticity on a point on the demand curve is measured by drawing tangent on that point. It can be explained with the help of a diagram.

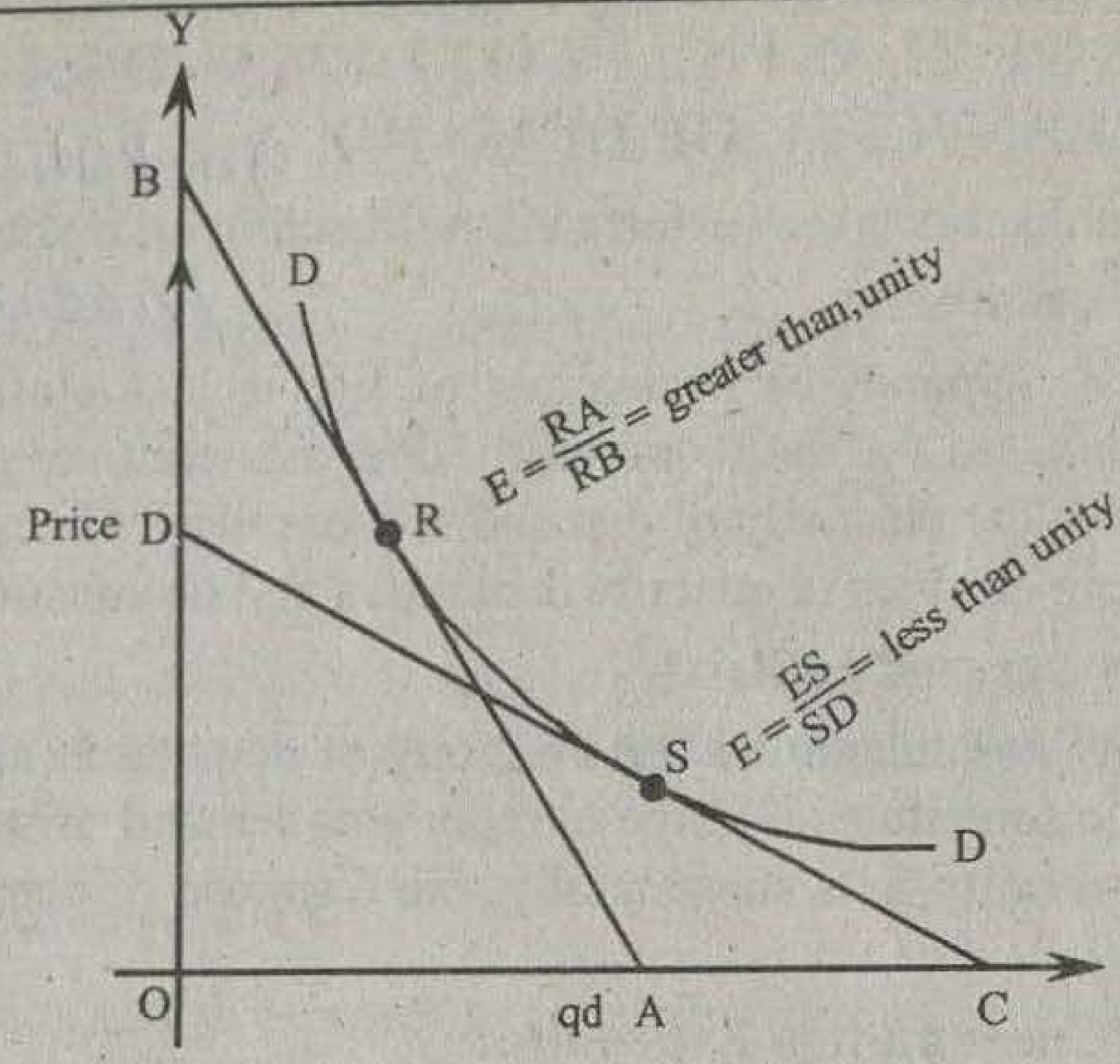


Fig. 2

Elasticity at point 'R' is $\frac{RA}{RB}$ and it is clear that lower portion is greater so elasticity is greater than unity and elasticity at 'S' is $\frac{SC}{SD}$ and it is clear that lower portion is smaller than the upper portion so elasticity is less than unity.

Elastic and Inelastic Demand

If the responsiveness or reaction of demand to a change in price is greater, the elasticity of demand is elastic or the absolute value is greater than one and if the responsiveness or reaction of demand to a change in price is less, the elasticity of demand is inelastic or the absolute value is less than one.

Perfectly Elastic, Perfectly Inelastic Demand and Unit Elastic Demand

The elasticity of demand is perfectly elastic or infinite elastic when the response or reaction in demand is too large as compared to a very small change in price that is the absolute value approaches to infinity and the elasticity of demand is perfectly inelastic or zero elastic, when the response or reaction in demand is very small as compared to a very big change in price or the absolute value approaches to zero. The elasticity of demand is unit elastic when the reaction or response in demand is just equal to a change in price, the elasticity of demand is unit elastic or the absolute value is equal to one. (These values are known as **special values of elasticity of demand.**

DETERMINANTS OF ELASTICITY OF DEMAND/FACTOR INFLUENCING ELASTCITY OF DEMAND

There are several factors which determine the elasticity of demand:

1. Nature of the Commodity

The elasticity of demand for necessities of life is less elastic because due to increase in price, the demand for that commodity does not contract proportionately and for comforts and luxuries the elasticity of demand is more elastic because even a smaller change in price brings big changes in quantity demanded and no substitutes elastic.

2. For Substitutes Demand is Elastic

If the commodity has substitutes the elasticity of demand is more elastic because when price increases the substitutes become cheaper and demand of substitutes increases. While demand for commodity falls substantially, the response of demand is greater than the change in price.

3. Share in Total Consumption Expenditure

If the share of commodity in total expenditure is greater to an increase in its price demand falls more, therefore, demand is more elastic and if the share is less then it does not effect the demand more and demand is less elastic (for necessities) for normal good it is more elastic.

4. Goods having Several Uses

If a commodity is having several uses, the demand is more elastic. If the price decreases it is used even in unnecessary uses. i.e., response of demand is greater to a change in price.

5. Durable Goods

The more durable is good, the greater is the elasticity and *vice versa*. Because if price increases people use that commodity for a long period.

6. Price Level

Elasticity of demand for those goods which are either high priced or low priced is less elastic. Because with a small increase in price poor people can not purchase high priced commodity and if the commodity is low priced then it is already purchased in sufficient quantity so further decrease in price does not cause an increase in demand.

7. Income Level

For rich, elasticity of demand for different commodities is less elastic because an increase in price does not effect their consumption expenditure. For poor, elasticity of demand is more elastic because even a smaller change in price brings greater change in demand.

8. Postponement of Demand

A commodity whose demand can be postponed elasticity is more elastic because to a smaller fall in price may bring greater demand & *vice versa*.

9. **Habit and Fashion or Consumer Loyalty**

A commodity which is liked by the people or it is in fashion, demand is less elastic because people purchase even at higher price.

10. **Number of Compliments or Joint Products**

If the good has many compliments the product is needed of the other items are used ($E > 1$).

11. **Future Expectations**

If price of commodity is expected to rise or fall in future, a small change in price produces a considerable change in demand and *vice versa*. Therefore, elasticity for those commodity is greater.

12. **Consumer Adjustment**

If consumers are slow to react to a change in price, the amount bought is largely unaffected. Price increase of complementary good leads to a decrease in quantity demanded of this good (as well as less) of the complement. Cross elasticity of demand is negative.

Although some of the factors have been stated above yet there is no hard and fast rule. These are the circumstances on which these factors depend.

TYPES OF ELASTICITY OF DEMAND

1. PRICE ELASTICITY OF DEMAND

If a change in demand is due to change in price of that commodity it is called price elasticity of demand. There are three methods to measure it.

(a) Total Outlay Method / Expenditure Method

In this method we compare changes in price with changes in total expenditure. If to a change in price there is no change in total expenditure, elasticity is equal to unity. If the change in price and total expenditure are inversely related, demand is more elastic. If the change in price and total expenditure are directly related, demand is less elastic.

(b) Proportionate Method / Percentage Method

In this method we compare proportionate change in demand with the proportionate change in price. If the percentage change in demand is equal to percentage change in price, elasticity is equal to unity. If the percentage change in demand is greater than the percentage change in price, demand is more elastic. If the percentage change in demand is less than the percentage change in price, demand is less elastic. i.e.,

$$\text{Elasticity} = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in price}}$$

(c) Geometrical Method

In this method we measure elasticity of demand on a demand curve. The formula to measure elasticity is:

$$\text{Elasticity} = \frac{\text{Lower point of the demand curve}}{\text{Upper point of the demand curve}}$$

(in case of curve we draw tangent on a point and measure elasticity with the help of above formula).

2. INCOME ELASTICITY OF DEMAND

If the change in demand is not due to change in price, but due to change in income, the elasticity is called income elasticity of demand. It can be written as:

$$\text{Income Elasticity} = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in income}}$$

OR

$$E = \frac{\Delta Q}{\Delta y} \times \frac{y}{q}$$

where 'Δy in change in income and y; is income.

Income elasticity of demand may be equal to unity, less than unity, more than unity, positive or negative.

(i) If the change in demand is equal to change in income, income elasticity is equal to unity. e.g., percentage change in demand is 20% and percentage change in income is 20 %.

(ii) If the change in demand is greater than the change in income, demand is more elastic. e.g., percentage change in income is 20% and change in quantity demanded is 30%.

(iii) If the change in demand is less than the change in income, demand is less elastic e.g., change in income is 20% and change in quantity demanded is 10%.

(iv) If with an increase is income demand decreases, income elasticity of demand is negative e.g., increase in income is 10% and decrease in original demand is 10%.

(v) If there is no change in demand to a change in income, income elasticity of demand is zero. e.g., change in income is 20% and no change in quantity demanded.

(vi) If there is no change in income but there is change in demand, income elasticity of demand is infinite. e.g., change in quantity demanded is 20% while there is no change in income.

3. CROSS ELASTICITY

If the change in demand is not due to change in price of that commodity but the change in demand is due to change in prices of inter related goods such as substitutes and complementary goods, the elasticity is called cross elasticity of demand. Cross elasticity is measured with the help of following formula:

$$\text{Cross Elasticity} = \frac{\text{Proportionate change in quantity demanded of commodity X}}{\text{Proportionate change in price of commodity Y}}$$

$$\text{XED} = \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x}$$

Where E_{xy} means, cross elasticity of demand for a good 'X' in respect of change in the price of good 'Y'. ΔQ_x means change in quantity demanded of commodity 'X' and ΔP_Y means change in price of commodity Y.

(1) Since XED can be negative it is important to induce −ve sign.

(2) If XED is +ve the good are in competitive demand i.e., substitutes.

(3) If XED is zero two products are unrelated i.e., independent goods.

4. POINT ELASTICITY OF DEMAND

(i) The elasticity on a single point on a demand curve is called the point elasticity of demand. Point elasticity of demand can be measured in two ways:

$$\text{or} \quad E = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

(ii) Point elasticity on a demand curve is measured with the help of following formula:

$$E = \frac{\text{Lower part of the demand curve}}{\text{Upper part of the demand curve}}$$

Note: It has been explained earlier in this chapter with the help of a figure.

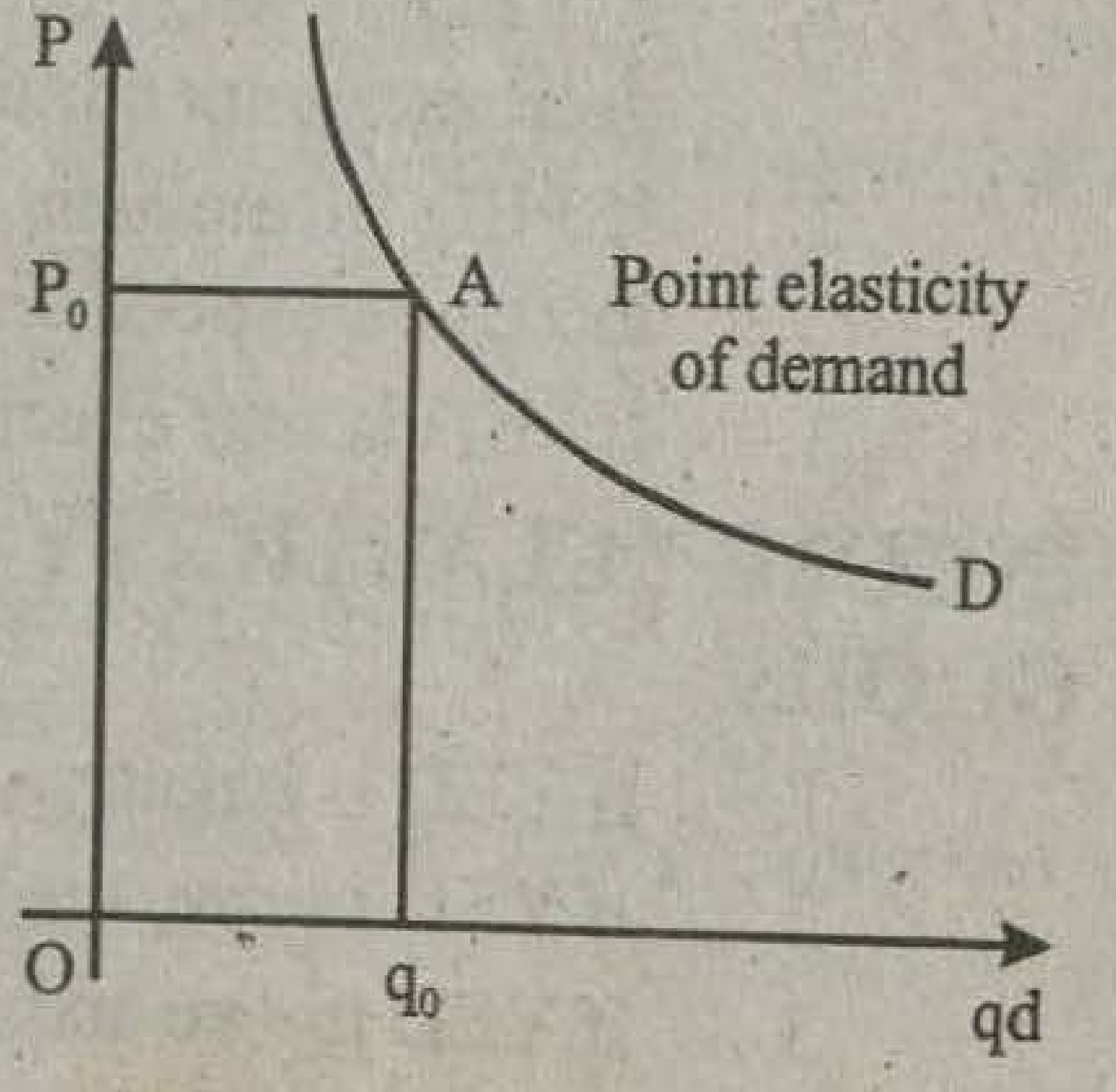
Example:

If price increases from Rs. 6 to Rs. 7 per kg., and demand contracts from 96 to 80 point elasticity is

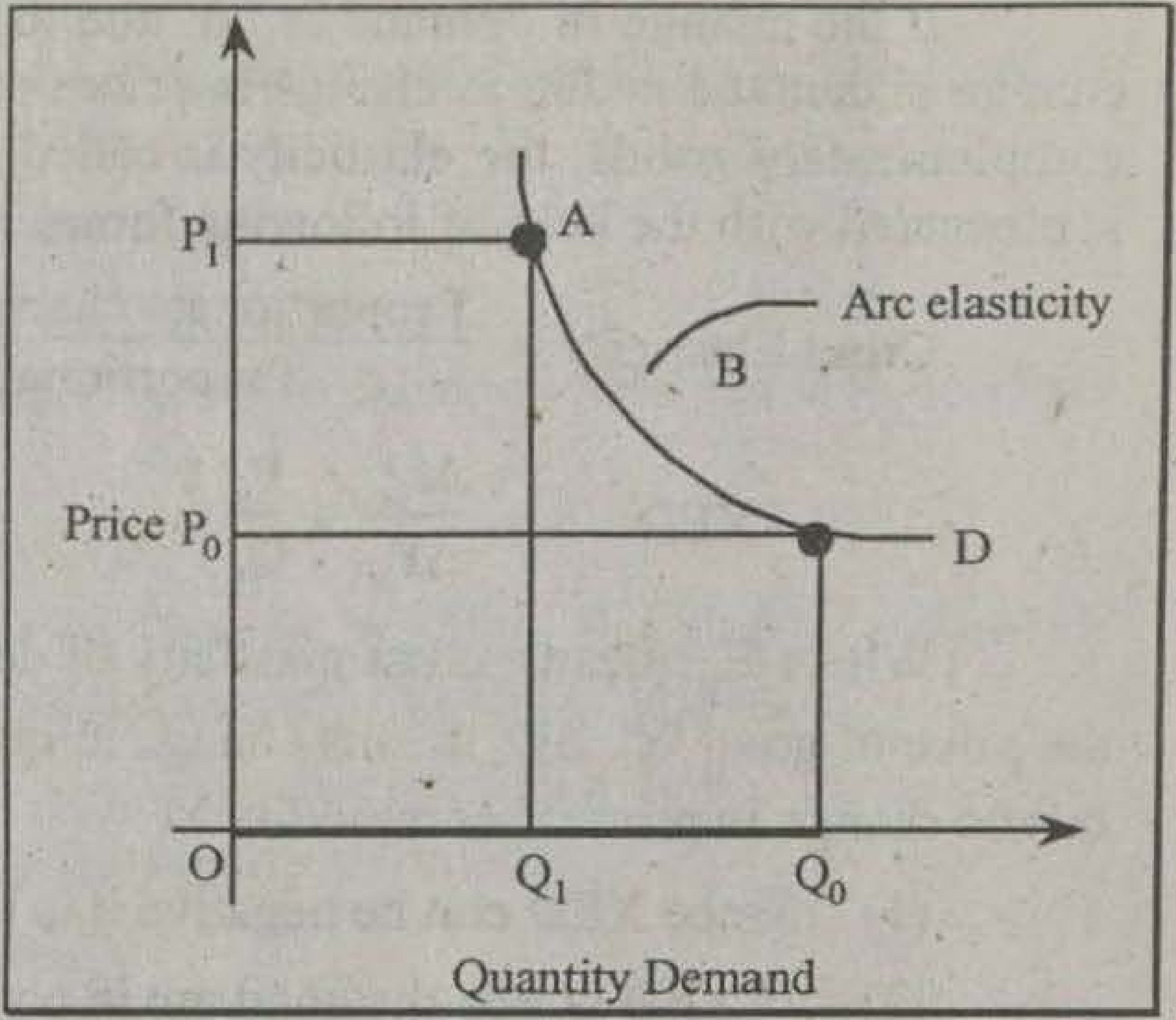
$$E = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

$E = -1$ i.e., equal to unity.

$$E = \frac{-16}{1} \times \frac{6}{96} = -1 \text{ i.e., } E = 1$$



5. ARC ELASTICITY OF DEMAND



The elasticity at two different points on the demand curve is Arc Elasticity of demand, or in the words of Baumol, "Arc elasticity is measure of the average responsiveness to price changes exhibited by a demand curve over some finite stretch of the curve".

The formula to measure Arc Elasticity of demand is:

$$E = \frac{Q_0 - Q_1}{Q_0 + Q_1} \times \frac{P_0 + P_1}{P_0 - P_1}$$

Where Q_0 is the original quantity and Q_1 is the new quantity. P_0 is the original price and P_1 is the new price, e.g., if price changes from Rs. 10 to 12 and quantity changes from 96 to 80, the elasticity is

$$E = \frac{80 - 96}{80 + 96} \times \frac{12 + 10}{12 - 10} = \frac{-16}{176} \times \frac{22}{2} = -1$$

PRICE ELASTICITY OF DEMAND AND REVENUE

The effect of a price change on revenue depends on the elasticity of demand.

1. If PED is elastic, a fall in price increases revenue.
2. If PED is elastic, a rise in price increase revenue.
3. If PED is unitary, a price change leaves revenue unchanged.

PRICE ELASTICITY OF DEMAND EXPENDITURE

The effect of a price change on expenditure depends on the elasticity of demand:

1. If PED is elastic, a fall in price increases expenditure and rise in price decreases expenditure.
2. If PED in inelastic, a fall in price decreases expenditure and a rise in price increases expenditure.
3. If PED is unit elastic, a price change leaves expenditure unchanged.

INCOME ELASTICITY OF DEMAND AND THE TYPE OF THE GOODS

1. If YED is negative, the product is an inferior good.
2. If YED is +ve, the product is a normal good.
3. If YED is +ve and greater than 1 (one), the product is superior good.

SHORT RUN AND LONG RUN DEMAND ELASTICITY

"Because it takes time to develop satisfactory substitutes, a demand that is inelastic in the short run may move inelastic when enough time has passed".

For example, at the time when cheap tea and ghee was first introduced in Indo-Pak sub-continent few households were purchasing tea and ghee. The initial measurements changed the demand for these products to be very inelastic.

The same is the example of electricity initially the demand was very little and the demand for electricity was to be very inelastic but as the people started purchasing electric appliances measured elasticity steadily increased.

Software and petroleum provide more recent examples. First the OPEC cartle shocked the world with a greater increases as oil price and the demand elasticity proved to be very inelastic but in the long run new substitutes were developed and with the discovery of solar energy atomic energy, gas energy made the demand elasticity for oil elastic in the long period similar is the case with computer technology.

IMPORTANCE OF ELASTICITY OF DEMAND

The importance of elasticity of demand can be viewed from the following:

1. For Finance Minister (More elastic and less elastic demand)

Basic job of a Finance Minister is to prepare Budget i.e., Annual Development Plan to fill the gap of over expenditures than revenue he has to impose either new taxes or to enhance the rate of old taxes or adjustment of taxes. The concept of elasticity of demand guides him and he levies more taxes on goods which are having more elastic demand i.e., luxuries and less taxes on goods where elasticity of demand is less e.g., necessities of life.

2. For Producers (Price changes and elasticity of goods)

Maximum profits is the basic objective of the producers and businessmen. The producers can increase the prices of those goods which are less elastic and avoids increase in prices of those goods which are more elastic because increase in price of more elastic goods mean contraction in demand.

3. Price Discrimination (Rich and Poor with elasticity)

Price discrimination means to charge different prices of the same product from different persons and in different areas and places. Price discrimination is possible only in monopoly. A monopolist charges higher price from those persons whose income is high and elasticity is greater while charges low price from poor. He may charge low price of comforts and luxuries and higher price for necessities because demand is less elastic for necessities and more elastic for comforts.

4. Determination of Fare (Rich and poor and elasticity)

The concept of elasticity of demand is kept in view while determining fare in transportation e.g., in Railways charges many types of fare:

(i) For 2nd class low fare

(ii) For first class high fare

(iii) Higher fare for first class Sleeper and highest for Air Conditioned (Sleeper)

(iv) For Air-conditioned class (Seater) parlour high fare

(v) For Air-conditioned (Sleeper) highest fare

(minimum for 2nd class passengers).

5. Joint Demand (Higher price for less elasticity and low price for elastic goods)

In case of goods which are sold, purchased or used jointly, higher price is charged for goods having less elastic demand and lower price is charged for goods having more elastic demand.

6. For Exporters (Less and more elastic)

Exporters are charging high prices for less elastic goods and lower price for more elastic goods.

7. Increasing Return Industry and lowering down the price to maximum profit

When industry is subject to increasing return, expansion in production lowers the average cost of the product. If at the same time the demand of such product is elastic, the producer can raise his profit by slightly reducing the price and producing larger quantity.

8. Wages

If the demand for a particular type of labour is inelastic firms, the labour union can easily get higher wages from the enterprenuers for the workers.

9. Paradox of Poverty in Plenty

If the demand for a product is inelastic, its increased production may result in less profit. Take an example of potatoes. Suppose their demand is inelastic. Now if farmers grow more potatoes, their total income will decrease rather than increase. So, for them, **plenty of potatoes means poverty**.

SUPPLY

The amount of goods and services produced are called production and the portions of the produce offered for sale at prevailing prices in a given period of time is known as supply. OR "Supply is a schedule of the amount of a product that would be offered for sale at all possible prices, at any instant of time e.g., a day, a week and so on".

Similar to demand supply is always related to a price of that product but there is direct relation between supply and price i.e., at higher prices larger quantities will be

offered because larger prices will bring more profit for traders and suppliers and at lower prices smaller quantities will be offered for sale because of low profit at low prices.

SUPPLY, STOCK AND HOARDING

Supply is the portion of the produce offered for sale at specific prices while the total amount of goods available at short notice. The amount of stock is fixed in the short period and the quantity of stock is not affected by the price changes of that product. Store is portion of the produce which will be offered for sale at fair prices and unless fair price is available the goods are stored while hoarding is a stock held for earning super normal profits or to exploit the consumers.

RESERVE PRICE AND FLOOR PRICE

Reserve price is the minimum price below which a supplier would not be supplying the goods in the market and floor price is also the minimum price is determined by the government buys goods from the producers if price falls that of floor price.

SUPPLY AND TIME PERIOD

Supply of a product depends upon the time period. Time period may be short, long or market period.

1. Market Period Supply

Generally by market period we mean one day i.e., when it is not possible to bring about any change in variable factors of production. Therefore market period supply means, one day supply. The concept of market period supply is linked with perishable goods whose supply can not be changed in one day e.g., supply of vegetables, fresh fruit, fresh milk, mutton, beaf, fish etc. However in case of durable goods the market period supply can be changed according to availability of existing stock.

2. Short Period Supply

Short period is a sufficient time period when only the variable factors of production (labour and raw material) can be changed while fixed factors of production (FOP) cannot be changed. Therefore, short period supply is the amount of goods offered for sale in the short period while sufficient changes in supply can be made but up to the extent of changes in variable FOP e.g., labour working capital).

3. Long Period Supply

Long period of time is the sufficient time period when not only the variable FOP but also the fixed FOP can be changed i.e., purchase of land, building, new capital assets or replacement of capital assets etc. Therefore, supply of a product in the long period of time is known as long period supply. Maximum changes in supply can be brought in the long period, each new firms can enter while old firm can exit.

MARKET PERIOD SHORT PERIOD AND LONG PERIOD PRICE

Market period price is highest because it is not possible to increase supply in the market period (decrease in supply in market period is not possible in case of perishable goods). As in the short period supply can be increased therefore price a less higher than market period. Finally in the long period the supply of goods can be increased upto the maximum possible limit therefore price is low as compared to short period and market period.

LAW OF SUPPLY

The law of supply explains direct relationship between price of a product and quantities supplied other things remaining the same i.e., more quantities are supplied at higher prices and smaller quantities are supplied at lower prices.

STATEMENT OF THE LAW

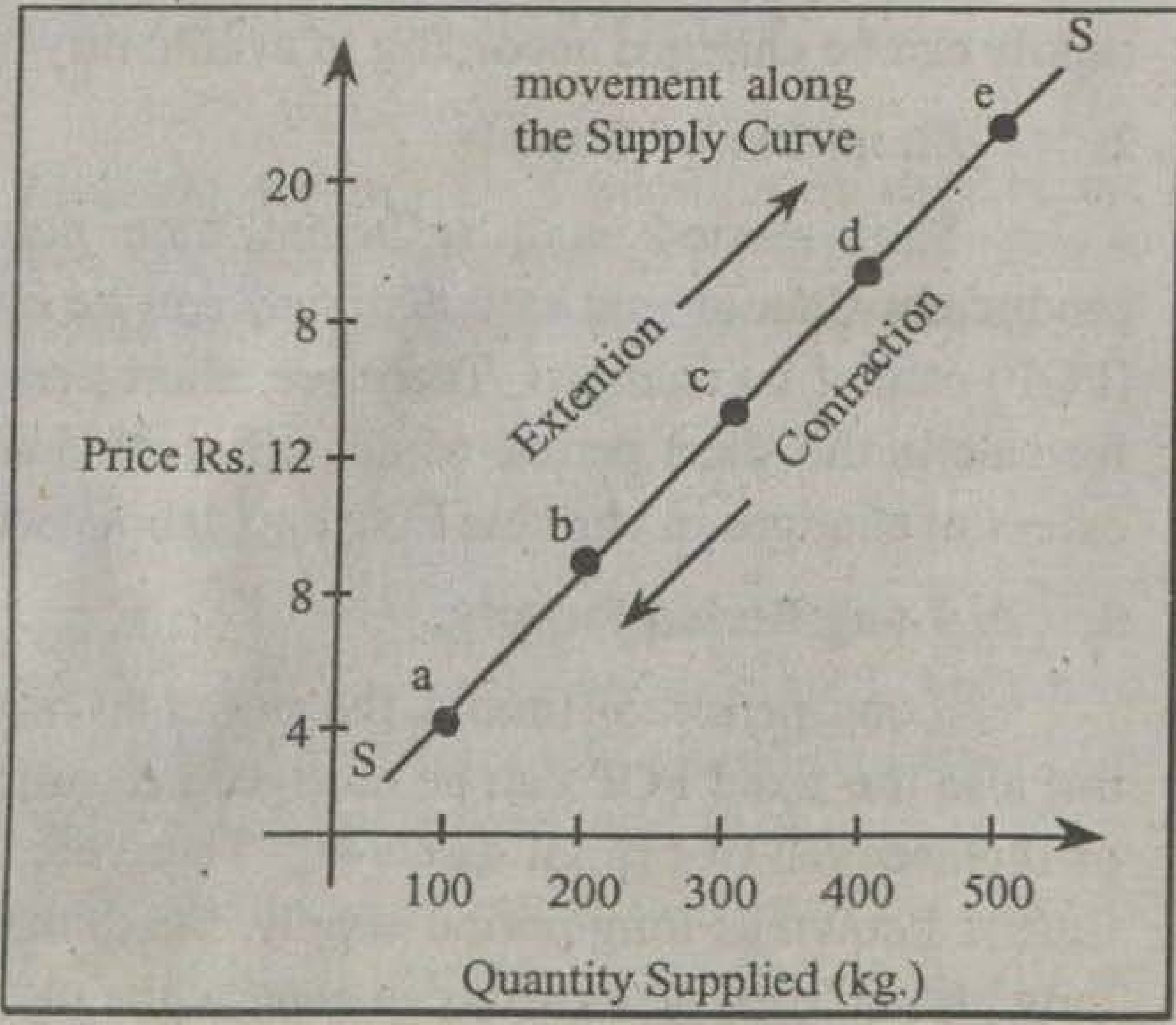
"Price and quantity supplied are directly related, other things remaining the same" i.e., increase in price of product brings an extension in quantity supplied of that product and vice versa.

The law of supply can be explained with the help of a schedule and a diagram.

SCHEDULE

	Price Rs. Per Kg.			Quantity Supplied	
	4			100	
	8		Extention in Supply	200	Contraction in Supply
Rise ↓	12			300	
	16	↑		400	
	20	Fall		500	

It is clear from the above schedule that when price is increasing from Rs. 4 per kg to Rs. 20/= per kg, quantity supplied is extending from 100 kg to 500 kg and when price of the product is falling, the quantity supplied is contracting from 500 kg to 100 kg which shows that there is a direct or positive relation between price of the product and quantity supplied i.e., Qs = f(P) (quantity supplied is a function of price of that product).



The diagram shows that with a rise in price there is a corresponding extention in quantity supplied price goes up from Rs. 4 per kg to Rs. 20 per kg and quantity supplied extended from 100 kg to 500 kg. If we join the points a, b, c, d and e (which are showing different levels of quantity supplied at different prices) we get supply curve.

SUPPLY CURVE

A graphical representation of the relationship between the supply of a commodity and its price (price measured on y-axis and quantity supplied measured on x-axis). The positive relationship between price and supply is reflected by the fact that the supply curve slopes upward from left to right.

ASSUMPTIONS / CONDITIONS / PARAMETERS / OTHER THINGS / FACTORS INFLUENCING ELASTICITY OF SUPPLY

The law of supply proves true when these assumption are satisfied.

1. **Cost of Production**

It is assumed that cost of production does not change because a rise in price because of rise in cost of production will not increase the supply quantity and a fall in price because of fall in cost of production will not decrease the supply quantity.

2. **No change in Technology / Method of Production**

It is assumed that neither the technological conditions are becoming obsolete nor there is improvement in the technology. New and better techniques of production always reduces the cost of production and fall in price and because of reduction in cost of production will not cause a decrease in supply quantity.

3. **Efficiency of Factors of Production**

Production process is a combination of four factors of production and if the efficiency of one or more FOP changes it does affect the production. Increase in efficiency means more production of low cost while low efficiency of FOP means low production at high cost.

4. **No New Discoveries and Innovations**

It is also assumed that there is no change in natural and productive resources because of new discoveries and innovation. As new discoveries mean more supply at the same or at low price therefore, it is assumed that there will be no change in natural resources because of new discoveries and innovation.

5. **Prices of Labour and Raw Materials do not change**

Changes in labour prices i.e., wages and raw material affects the cost of production e.g., an increase in wages and raw material prices would give rise to cost of production and consequently the producers will increase the supply price but as profits will not increase therefore, supply quantity may remain the same or there may be decrease in supply at high prices.

6. **Govt. Policy (Taxation)**

If Govt's taxation policy changes it also brings changes in cost of production e.g., increase in direct taxes would discourage more production because of low profits and like

wise reduction in direct taxes may encourage production and supply because at low tax rates, profits will increase which may induce the suppliers to increase the supply quantity.

7. Natural Calamites and Wars i.e., unforeseen circumstances

The supply is effected during floods storms, earth quakes, disease and lowest attack on agricultural crops will be affecting the supply and the law of supply may not hold.

8. Weather conditions and Seasons

Supply of agricultural products also depends on favourable and unfavourable climatic and weather conditions e.g., during favourable weather conditions and change of seasons there are a larger quantities of the produce and in the unfavourable conditions there are smaller quantities of the produce irrespective of changes in price.

9. No change in the prices of competitive supply.
10. No change in price of good in joint supply.
11. No new firms entering into an industry.
12. No change in price and supply of alternative products which a firm can make.
13. No change in the goals of the producers.

CHANGES IN SUPPLY

Changes in supply quantities are viewed from two sides i.e., change in supply because of change in price of that product and changes in supply quantity because of changes in other factors explained above. Changes in supply because of change in product's own price or known as extension in supply and contraction in supply i.e., movement along the supply curve upward movement shows extension and downward movement shows contraction in supply as already explained in the diagram while explaining the law of supply. Change in supply quantity not because of change in products own price but because of changes in other factors is known as "rise and fall" in supply i.e., shifting of the supply curve.

Shift of Supply Curve (Rise and Fall of Supply)

A change in supply quantity not because of change in its own price but because of other factors e.g., cost of production changes, technological changes, changes in govt. policies or natural calamities or because of new discoveries is known as "rise or fall" in supply.

Outward/Rightward/Forward Shift and Inward/Leftward/Backward Shift in Supply Curve

The change in supply because of change in the assumptions/conditions/factors/ determinants i.e., other than price cause shift in supply curve. The shift may be outward or inward. Whenever there is a change in conditions other than price it may cause outward and inward shift simultaneously. Increase in cost of production will shift the supply curve inward and decrease in cost of production will shift the supply curve outward.

The following factors will shift the supply curve outward:

(i) Decrease in cost of production.
(ii) Improvement in the technology or method of production.
(iii) Increase in efficiency of factors of production.

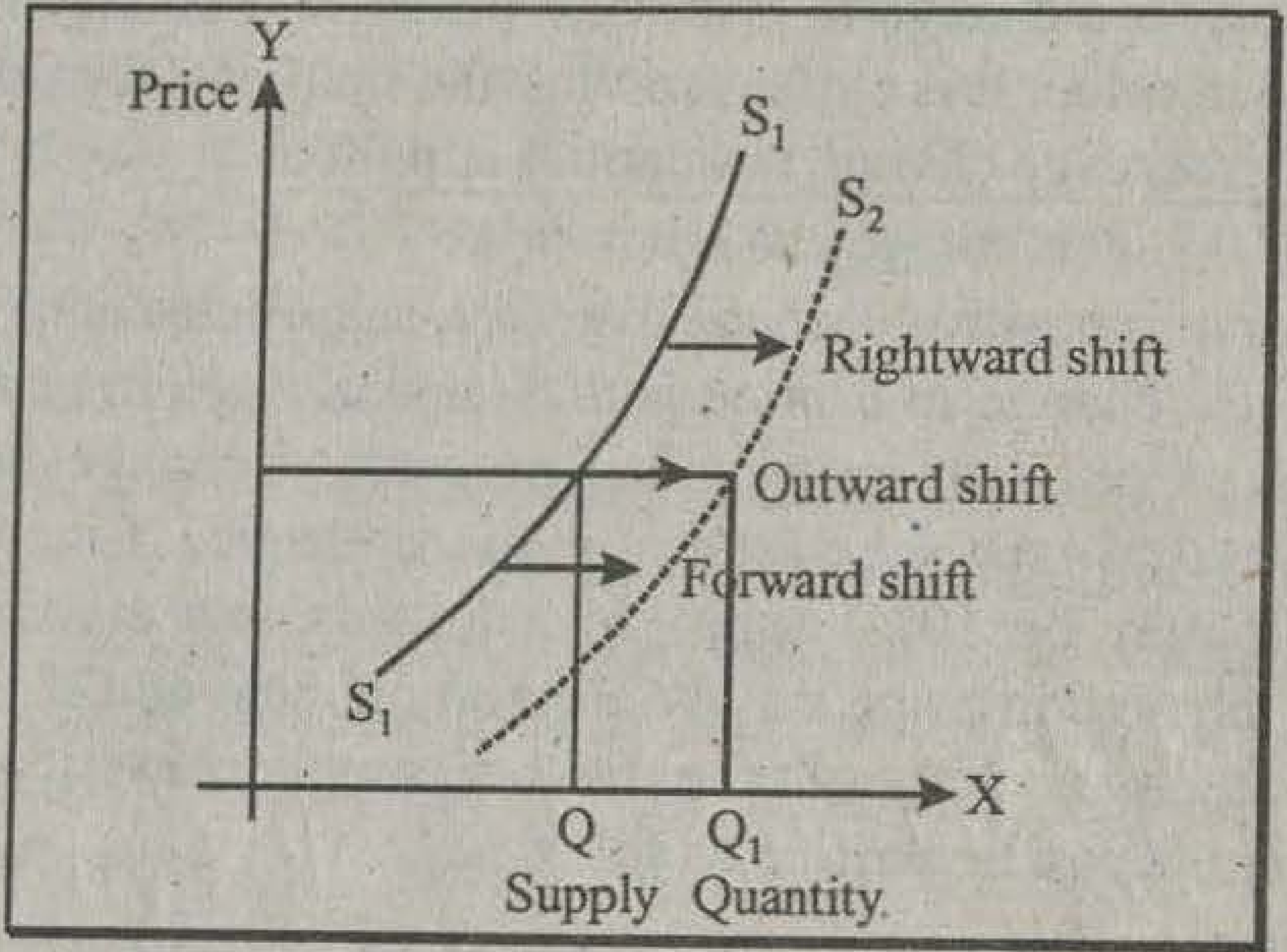
(iv) New discoveries and innovations.

(v) Removing old indirect tax.

(vi) Increase in price of competitive supply.

(vii) New firms entering into industry.

The outward shift can be explained with the help of diagram.



The following factors will cause the inward shift in market supply:

(i) Increase in cost of production.

(ii) Olden techniques of production.

(iii) Low efficiency of factors of production.

(iv) No new discoveries and innovations.

(v) Imposing new indirect taxes.

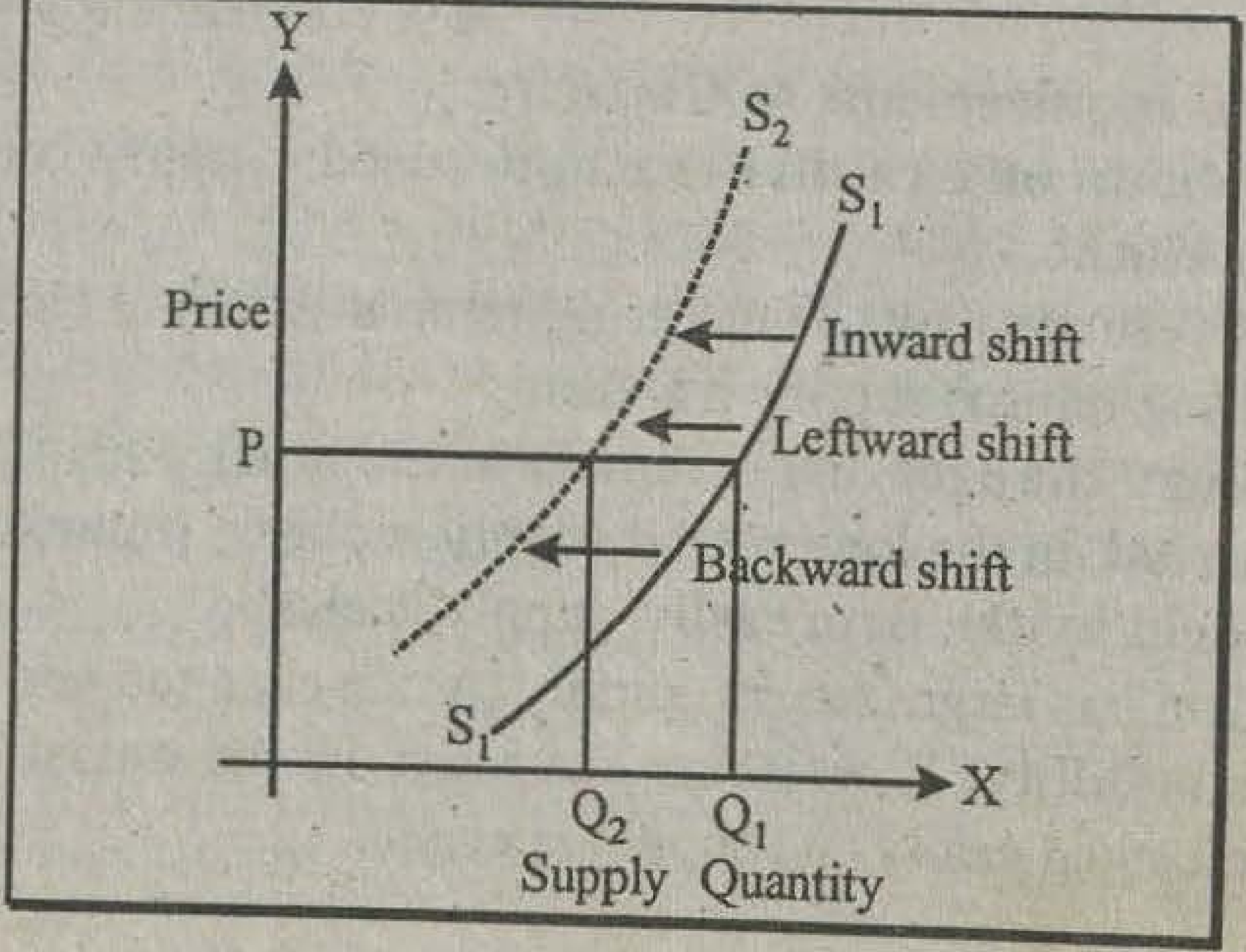
(vi) Natural calamities and wars.

(vii) Decrease in prices of substitutes.

(viii) Increase in the price of good in joint supply.

(ix) Restrictions / ban of entering new firms.

Inward shift can be shown with the help of a diagram.



ELASTICITY OF SUPPLY

Law of supply explains direct relationship between price and supply quantity of that product. Where price is an independent variable and supply quantity is a dependent variable i.e., supply shows reaction and response to a change in price.

The price elasticity of supply or simply supply elasticity is defined as a degrees of responsiveness in supply to a change in price or a percentage change in quantity supplied to a percentage change in price. It is explained with the help of a formula:

$$E = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

Since supply curve is positively sloped therefore, supply elasticity is normally positive.

For example: if a change in a price is 20% and change in supply quantity is also 20%, supply elasticity is equal to unity and if percentage change in supply quantity is 30% (i.e., greater than 20%) supply elasticity is more elastic. If the change in supply is less than 20% (i.e., it may be 10%) supply elasticity is less elastic and if there is no change in supply to a change in price supply elasticity is zero and if there is no change in price but supply is changing because of other factors, supply elasticity is infinite elastic.

The above formula can be written as follows:

$$Es = \frac{\Delta qs}{\Delta P} \times \frac{P}{qs}$$

DETERMINANTS OF ELASTICITY OF SUPPLY

The determinants of elasticity of supply:

1. **The number of firms in the industry**. Large number of firms supply is elastic.
2. **The length of the production period**. Elastic in few hours (industry) inelastic in long hours (agriculture).
3. **The existence of spare quantity**. Supply is elastic
4. **The ease of accumulating stock**. Supply is elastic
5. **The ease of substitution of F.O.P. from one production to another production**. Supply is elastic
6. **Efficiency of production function**. More efficient supply is elastic, less efficient supply is inelastic
7. **Financial requirements or Capacity:**
   If the labour and capital are underused. Supply can be changed easily supply is elastic.
8. **Laws of returns,** law of increasing returns supply is elastic and in the law of diminishing returns supply is inelastic
9. **Technology changes,** improvement in technology supply is elastic
10. **Time period,** in the long period supply is elastic (industry)
11. **Stocks held by the firm easily,** supply is elastic.
    (If the firm has larger stocks, supply can be changed and supply is elastic)
12. **Factors mobility:** If resources can move in and out of the industry supplies can be changed easily and supply is elastic.

SHORT QUESTION ANSWER

Q.1 Explain the concept of demand.

Ans. Demand: "The demand for anything at a given price is the amount of it, which will be bought per unit of time at that price". Or by demand we mean various quantities of a given commodity or service which consumer would buy in one market in a given period of time at various prices or at various income. Or at various prices of related good.

Q.2 Give the statement of law of demand.

Ans. Law of Demand: Law of demand can be stated as "Other things remaining the same a rise in the price of a commodity or service is followed by a contraction in demand and a fall in price is followed by an extension in demand". That is there is an inverse relationship between price and quantity demanded. We may write the law of demand as Qd = f(P), where 'Qd' means quantity demanded and 'P' is price, 'f' means function i.e., quantity demanded is a function of price.

Q.3 Differentiate individual demand and market demand.

Ans. Individual Demand Curve and Market Demand Curve: An individual consumer's demand curve relates the price of a commodity to the amount that the consumer wishes. While the market demand curve is the sum of total of individual demand curves of all the consumers in the market. The market demand curve relates the total quantity demanded of a product to its own price on the assumption that all other prices, total income, its distribution among individuals, and tastes are kept constant.

Q.4 Write short note on extension and contraction demand or movement along the demand curve.

Ans. Extension and Contraction in Demand: According to the law of demand other things being equal if price of a commodity rises, demand for that commodity contracts and fall in price brings an extension in demand i.e., price and quantity demanded are inversely related. If the change in demand is due to change in price it is called extension or contraction in demand instead of rise or fall in demand e.g., if price of a commodity increases we shall say that demand has contracted instead of fall in demand and if the price of a commodity falls we say that demand has extended instead of rise in demand.

Q.5 What is "Rise and fall in demand", or which causes shift in demand curve?

Ans. Rise and Fall in Demand: If the change in demand is not due to change in price, but due to change in some other factors, demand may change e.g., due to change in income, discovery of a new substitutes, change in prices of the substitutes, change in future expectations, change in population, change in weather or change

in taste and fashion, the demand may change. The increase in demand is called "a rise of demand" and if demand decreases it is called "a fall in demand" or it is called shift in demand.

Q.6 Briefly discuss the concept of elasticity of demand.

Ans. Concept of Elasticity of Demand: By elasticity of demand or price elasticity of demand is the rate at which the quantity demanded varies with a change in price, or it is the measure of relative change in amount purchased in response to a relative change in price on a given demand curve. According to Marshall "The elasticity or responsiveness of a demand in a market is great or small according to the amount demanded increases much or little for a given fall in price, and diminishes much or little for a given rise in price".

Q.7 Define and differentiate income elasticity of demand and cross elasticity of demand.

Ans. Income Elasticity of Demand: If the change in demand is not due to change in price, but due to change in income, the elasticity is called income elasticity of demand. It can be written as:

$$\text{Income Elasticity} = \frac{\text{Proportionate change in quantity demanded}}{\text{Proportionate change in income}}$$

$$E = \frac{\Delta Q}{\Delta y} \times \frac{y}{q}$$

where 'Δy in change in income and y, is income.

Cross Elasticity: If the change in demand is not due to change in price of that commodity but the change in demand is due to change in prices of inter related goods such as substitutes and complementary goods, the elasticity is called cross elasticity of demand. Cross elasticity is measured with the help of following formula:

$$\text{Cross Elasticity} = \frac{\text{Proportionate change in quantity demanded of commodity X}}{\text{Proportionate change in price of commodity Y}}$$

$$E = \frac{\Delta Q_x}{\Delta P_y} \times \frac{P_y}{Q_x}$$

Q.8 What do you mean by point elasticity of demand.

Ans. Point Elasticity of Demand:

(i) The elasticity on a single point on a demand curve is called the point elasticity of demand. Point elasticity of demand can be measured in two ways:

or $$E = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

(ii) Point elasticity on a demand curve is measured with the help of following formula.

$$E = \frac{\text{Lower part of the demand curve}}{\text{Upper part of the demand curve}}$$

Q.8 What do you mean by point elasticity of demand.

Ans. **Arc Elasticity of Demand:** The elasticity at two different points on the demand curve is Arc Elasticity of demand, or in the words of Baumol, "Arc elasticity is measure of the average responsiveness to price changes exhibited by a demand curve over some finite stretch of the curve".

Q.10 Give the concept of "House holds".

Ans. **House-holds:** It may be defined as all the people who live under one roof and who make joint financial decisions:

Q.11 Give major determinants/factors of demand function.

Ans. **The Determinants of Quantity Demanded:**

(i) The price of the product.

(ii) The prices of other products.

(iii) The consumers income & wealth.

(iv) Different sociological factors.

(v) The consumer's taste, fashion, habits.

Q.12 Differentiate between 'movement along the demand curve' and shift in the demand curve.

Ans. **Movement along a Demand Curve:** A movement along a demand curve indicates a change in quantity demanded in response to a change in product's own price.

Shift in Demand Curve: A shift in demand curve indicates a change in the quantity demanded at each price in response to a change in one of the conditions held constant along a demand curve.

Q.13 Define supply.

Ans. **Supply:** The amount of goods and services produced are called production and the portions of the produce offered for sale at prevailing price in a given period of time is known as supply. OR "Supply is a schedule of the amount of a product that would be offered for sale at all possible prices, at any instant of time e.g., a day, a week and so on".

Q.14 Differentiate between supply. Stock store and hoarding.

Ans. **Supply, Stock and Hoarding:** Supply is the portion of the produce offered for sale at specific prices while the total amount of goods available at short notice. The amount of stock is fixed in the short period and the quantity of stock is not affected by the price changes of that product. Store is portion of the produce which will be offered for sale at fair prices and unless fair price is available the goods are stored while hoarding is a stock held for earning super normal profits or to exploit the consumers.

Q.15 What is reserve price for a producer?

Ans. Reserve Price: Reserve price is the minimum price below which a supplier would not be supplying the goods in the market and floor price is also the minimum price but determined by the government. Government buys goods from the producers if price falls that of floor price.

Q.16 Define market period supply.

Ans. Market Period Supply: Generally by market period we mean one day i.e., when it is not possible to bring about any change in variable factors of production. Therefore market period supply means, one-day supply. The concept of market period supply is linked with perishable goods whose supply cannot be changed in one day e.g., supply of vegetables, fresh fruit, fresh milk, mutton, beaf, fish etc.

Q.17 Define short period supply.

Ans. Short Period Supply: Short period is a sufficient time period when only the variable factors of production (labour and raw material) can be changed while fixed factors of production (FOP) cannot be changed. Therefore, short period supply is the amount of goods offered for sale in the short period while sufficient changes in supply can be made but up to the extent of changes in variable FOP e.g., labour working capital).

Q.18 Define long period supply.

Ans. Long Period Supply: Long period of time is the sufficient time period when not only the variable FOP but also the fixed FOP can be changed i.e., purchase of land, building, new capital assets or replacement of capital assets etc. Therefore, supply of a product in the long period of time is known as long period supply. Maximum changes in supply can be brought in the long period, new firms can enter while old firm can exit.

Q.19 Define and differentiate between market period price, short period price and long period price.

Ans. Market Period, Short Period and Long Period Price: Market period price is highest because it is not possible to increase supply in the market period (decrease in supply in market period is not possible in case of perishable goods). As in the short period supply can be increased therefore price is less higher than market period. Finally in the long period the supply of goods can be increased upto the maximum possible. Finally in the long period the supply of goods can be increased upto the maximum possible limit therefore price is low as compared to short period and market period.

Q.20 Give the statement of law of supply.

Ans. Law of Supply: The law of supply explains direct relationship between price of a product and quantities supplied other things remaining the same i.e., more quantities are supplied at higher prices and smaller quantities are supplied at lower prices.

Statement of the Law: "Price and quantity supplied are direct related, other things remaining the same" i.e., increase in price of product brings an increase in quantity supplied of that product and *vice versa*.

Q.21 Define supply curve why it slopes upward from left to right.

Ans. Supply Curve: A graphical representation of the relationship between the supply of a commodity and its price (price measured on y-axis and quantity supplied measured on x-axis). The positive relationship between price and supply is reflected by the fact that the supply curve slopes upward from left to right.

Q.22 What is meant by shift in supply curve?

Ans. Shift is Supply Curve (Rise and Fall of Supply): A change in supply quantity not because of change in its own price but because of other factors e.g., change in cost of production, technological changes, change in govt. policies or natural calamities or because of new discoveries is known as "rise of fall" in supply or shift in supply curve.

Q.23 Define supply elasticity.

Ans. Elasticity of Supply: Law of supply explains direct relationship between price and supply quantity of that product. Where price is an independent variable and supply quantity is a dependent variable i.e., supply shows reaction and response to a change in price.

The price elasticity of supply or simply supply elasticity is defined as a degrees of responsiveness in supply to a change in price or a percentage change in quantity supplied to a percentage change in price. It is explained with the help of a formula:

$$E = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

Since supply curve is positively sloped therefore, supply elasticity is normally positive.

Q.24 Differentiate between substitutes and complements.

Ans. Substitutes and Complements: There are number of goods for which the market demand curve is inter-connected. These correlated goods are either known as substitutes or complements. Substitutes or goods which can be used is alternative to each other and complements are those goods which care bought and sold together.

Q.25 Give basic assumptions about rationality of a consumer.

Ans. Assumptions about Rationality:

(i) The consumer prefers more goods to less.

(ii) The consumers are willing to substitute one good for another.

(iii) Choices are transitive.

(iv) To maximize satisfaction out of scarce resources.

EXERCISE

Q.1 (a) Differentiate individual demand and market demand.

(b) State and explain law of demand. On what parameters it proves true.

Q.2 What do you understand by outward and inward shift in demand and explain the factors which causes these shift. Use diagrams for illustration.

Q.3 Define elasticity of demand and differentiate the following:

(i) Elastic and inelastic demand.

(ii) Perfectly elastic and perfectly inelastic demand.

Q.4 Explain the methods of measuring elasticity of demand.

Q.5 Describe in brief the factors which determine elasticity of demand.

Q.6 Write short note on the following:

(i) Point elasticity of demand and arc elasticity of demand.

(ii) Income elasticity of demand.

(iii) Cross elastic of demand.

Q.7 What is the importance of elasticity of demand in our life?

Q.8 Differentiate the following concepts:

(i) Substitutes and complements.

(ii) Supply, stock and hoarding.

(iii) Reserve price and floor price.

(iv) Market period supply and short period supply.

Q.9 State and explain the law of supply. On what assumptions it proves true.

Q.10 What do you understand by outward and inward shift in supply curve? What factors bring a outward and inward shift in market supply curve?

CHAPTER

4

MARKET EQUILIBRIUM

EQUILIBRIUM

Equilibrium means a state of balance. When forces acting in opposite directions are exactly equal, the object on which they are acting is said to be in a state of equilibrium.

EQUILIBRIUM PRICE AND EQUILIBRIUM QUANTITY

Equilibrium price under perfect competition is determined through the forces of demand and supply. Both quantity demanded and quantity supplied varies with price. Equilibrium price is determined by the interaction of demand and supply. By demand we mean the demand of all the buyers and by supply we mean supply of all the firms. The price at which quantity demanded is equal to quantity supplied is called the equilibrium price. Since forces of demand and supply are balanced at this price, the quantity bought and sold is known as equilibrium quantity.

A market structure is perfectly competitive if the following conditions hold:

1. Very large number of buyers and sellers i.e., there are 60 to 70 firms which are competing with one another so that price charged by each firm is minimum.
2. Products are homogeneous. i.e., all the units are similar in volume, weight colour, taste, brand, label etc.
3. Both producers and buyers i.e., firms and consumers possess perfect knowledge about the prevailing price and current bids in the market.
4. Entry and exit from the industry is free for the firms.
5. Transportation cost is negligible.
6. The factors of production are perfectly mobile.

The above conditions hold the price in the market for a commodity homogeneous and minimum i.e., only normal profits are earned.

According to law of demand if price of commodity rises demand contracts and if price falls demand extends. According to law of supply if price rises supply extends and if price falls supply contracts.

Assume that demand and supply of a product at different prices are given below:

Price Per Kg. (Rs.)	Quantity Demanded Quintles (i.e., 100 Kg.)	Quantity Supplied Quintles
20	50	250
16	100	200
12	150	150
8	200	100
4	250	50

It is clear from the schedule that quantity demanded is equal to quantity supplied as price Rs. 12 per kg. hence price of Rs. 12 will persist in the market, because at this level there is no tendency for it to rise or fall. If price rise to Rs. 16 i.e., above the equilibrium level, the quantity supplied is 200 quintles by the sellers, and quantity demanded by the buyers is 100 quintles, there is a tendency for the price to full. If price falls to Rs. 8 per kg i.e., below the equilibrium price, the quantity supplied is 100 Qtls and quantity demanded is 200 Quintles. There is a tendency for the price to rise.

So at, equilibrium price the whole quantity of product offered for sale, will be purchased by the buyers. Thus price Rs. 12 per kg. is the equilibrium price and 150 quintles is the equilibrium quantity. This can be shown with the help of a diagram.

On x-axis quantity demanded and supplied have been measured and price has been measured on y-axis. DD, is the demand curve which slopes downward. SS is the supply which slopes up ward. Both the demand and supply curves intersect each other at E. At the point of intersection quantity demanded is equal to quantity supplied i.e., 150 quintles and equilibrium price is Rs. 12 per kg. If price is Rs. 16 there is an over production or excess of supply or shortage of demand and there is tendency for the price to fall as shown by the arrow-head. If Price is Rs. 8 there is an excess of demand or shortage of supply and hence, there is tendency for the price to rise as shown by the arrowhead. Therefore, Rs. 12 is the equilibrium price which has been determined through the quantity demanded and supplied.

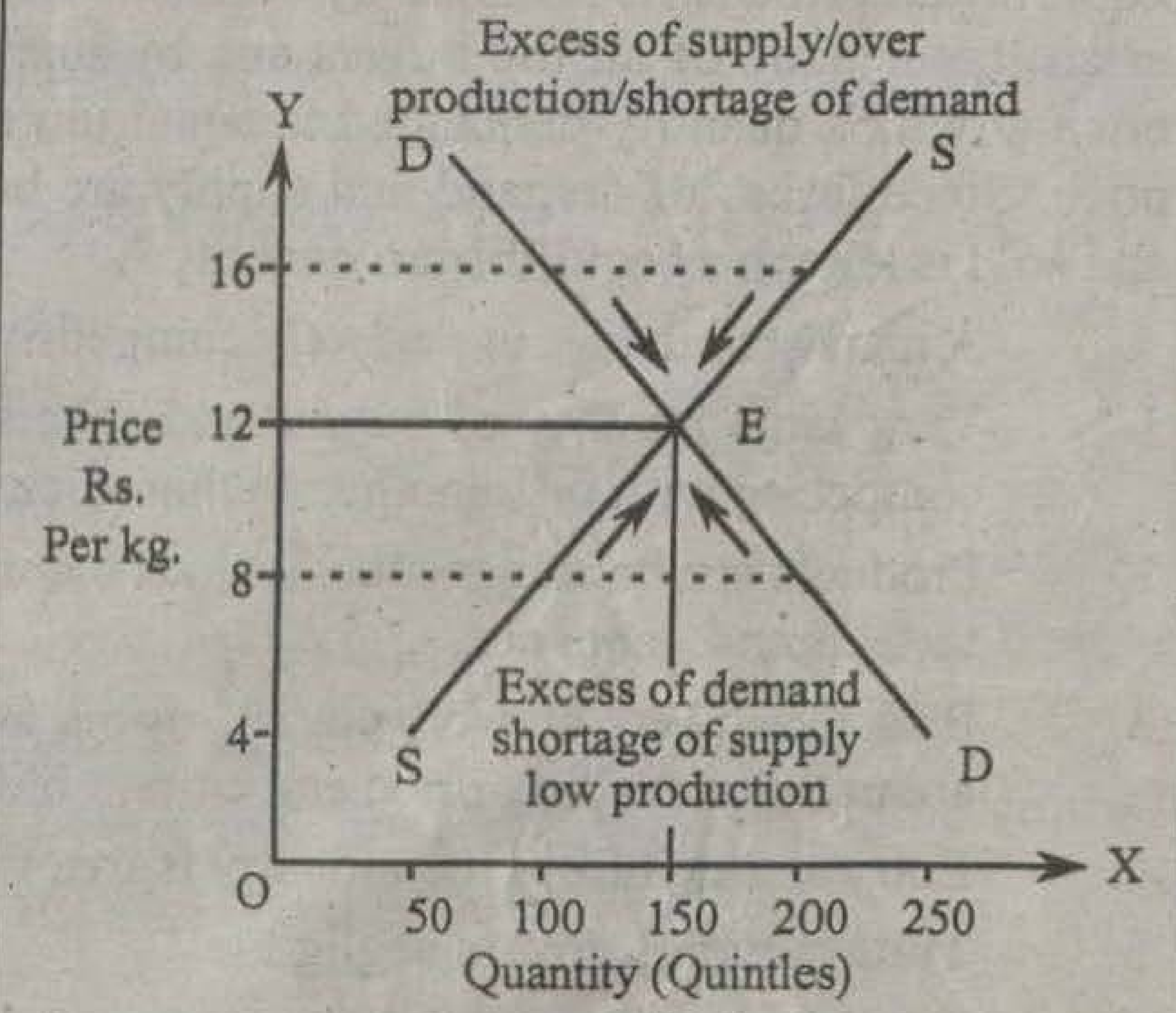


Fig. 1

Change in demand or supply condition will change the equilibrium price. Increase in demand, supply curve remains the same will raise the price and decrease in demand will lower the price as shown in the figure.

In the diagram DD, is the demand curve and SS, is the supply curve. Both the curves intersect at E and equilibrium price is P and equilibrium quantity is Q. If demand increases from DD to D′D′. New demand curve D′D′ intersects supply curve SS at point E′. If demand falls from DD to D″D″ new demand curve intersect supply curves SS at point E″.

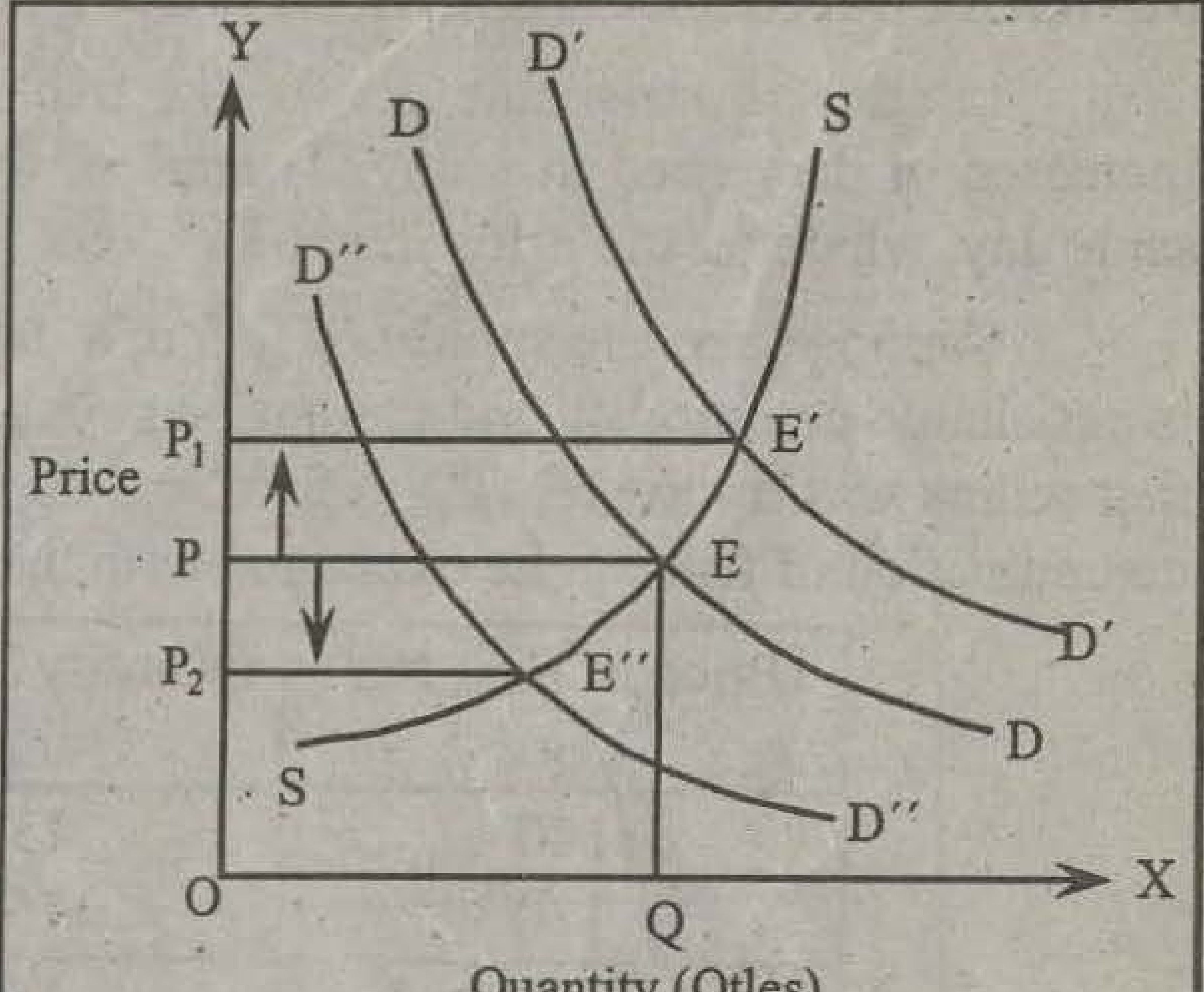


Fig. 2

In the diagram demand curve DD and supply curve SS intersect at point E hence, equilibrium price is P. Given the demand, if supply increases from SS to S′S′, equilibrium price is P_1 because new supply curve S′S′ intersects demand curve DD at E′. If supply decreases from SS to S″S″, equilibrium price will be 'P_2' because new supply curve S″S″ intersects demand curve at E″.

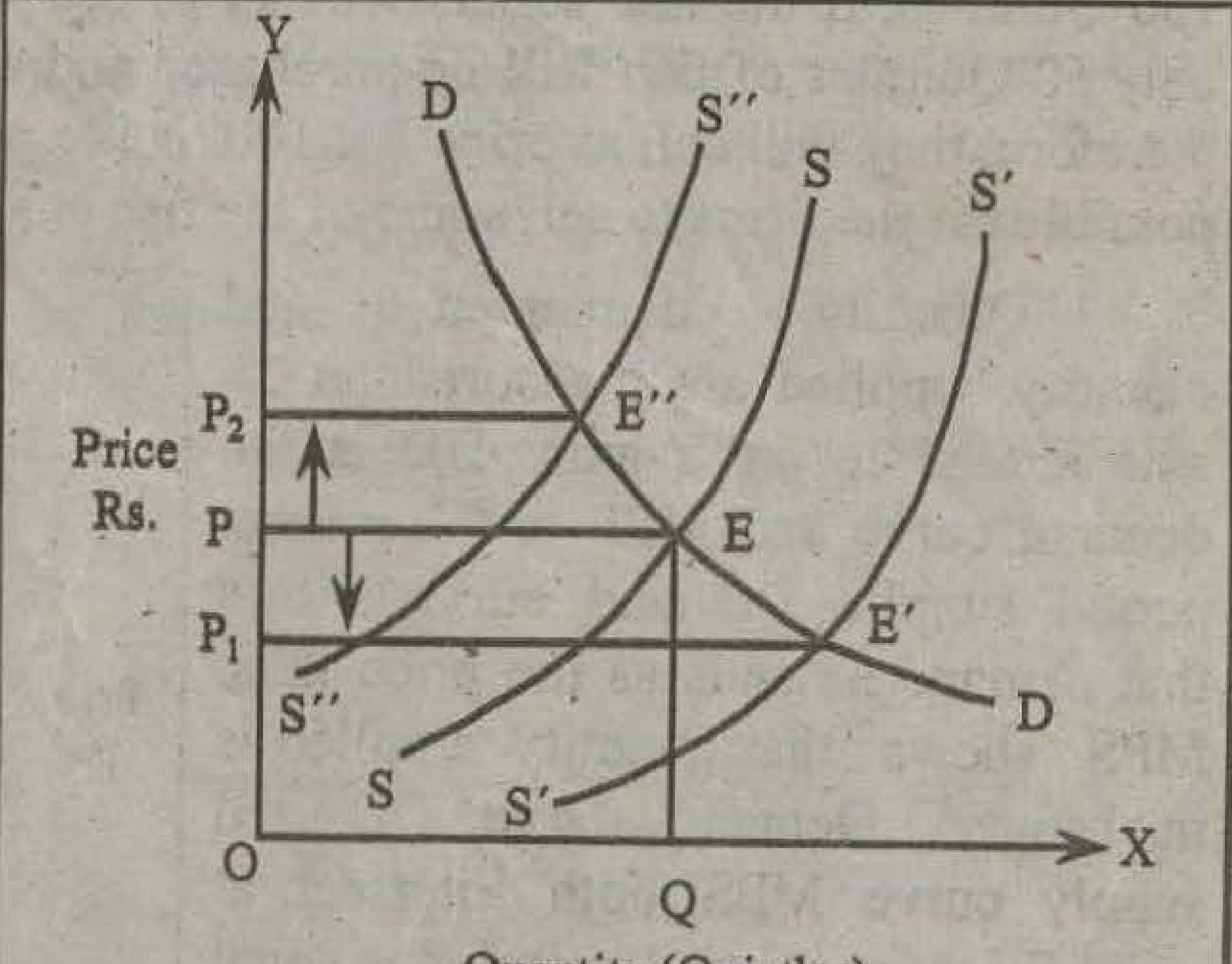


Fig. 3

MARKET PRICE DETERMINATION

Market price is determined through the quantity of demand and supply in the market period or very short period. The market period is a period in which the maximum that can be supplied is limited by the existing stock. The market period depends upon the nature of the product. Market price is determined daily by the forces of demand and supply. If demand is greater than the supply, price increases and *vice versa*.

MARKET PRICE DETERMINATION FOR PERISHABLE GOODS

In case of perishable goods like fish, vegetables, milk etc., the supply cannot be increased or decreased in a day. Therefore, whole of the commodity must be sold on the same day, whatever the price may be.

Suppose that the supply of fish in a day is 150 quintles in the market. Because fish is perishable commodity and cannot be stored for longer time by ordinary means therefore fish sellers will try to sell all the fish because it cannot be kept back for the next day. Price determination of fish can be explained with the help of a schedule and diagram.

Price of Fish Per Kg.	Quantity Supplied Quintals	Quantity Demand Quintals
140	150	50
120	150	100
100	150	150
80	150	200
60	150	250

It is clear from the schedule that market price is 100 and equilibrium quantity is 150 Quintles. If the fish sellers will try to sell whole of the fish at price Rs. 140 per kg only 50 Quintles of fish will be purchased and as it cannot be kept back for the next day therefore, they will sell at price Rs. 100 due to perfect competition in the market. It is not possible for the firms to sell some of the fish at a higher price than the equilibrium price.

Quantity demanded and quantity supplied are measured on X-axis and price on Y-axis. DD is the demand curve and MPS is the market period supply. Demand curve shows that demand extends as the price falls. MPS shows that quantity supplied is unchanged. Demand curve DD and supply curve MPS both intersect at point E i.e., quantity demanded is equal to quantity supplied. Therefore equilibrium price is Rs.100 and equilibrium quantity is 150 Qtls. If demand increases in a day from DD to D′D′ price rises from Rs. 100 to Rs. 120 because new demand curve D′D′ intersects supply curve at point E′. If demand falls from DD to D″D″, price falls from Rs. 100 to Rs. 80 because new demand curve D″D″ intersects supply curve at point E″.

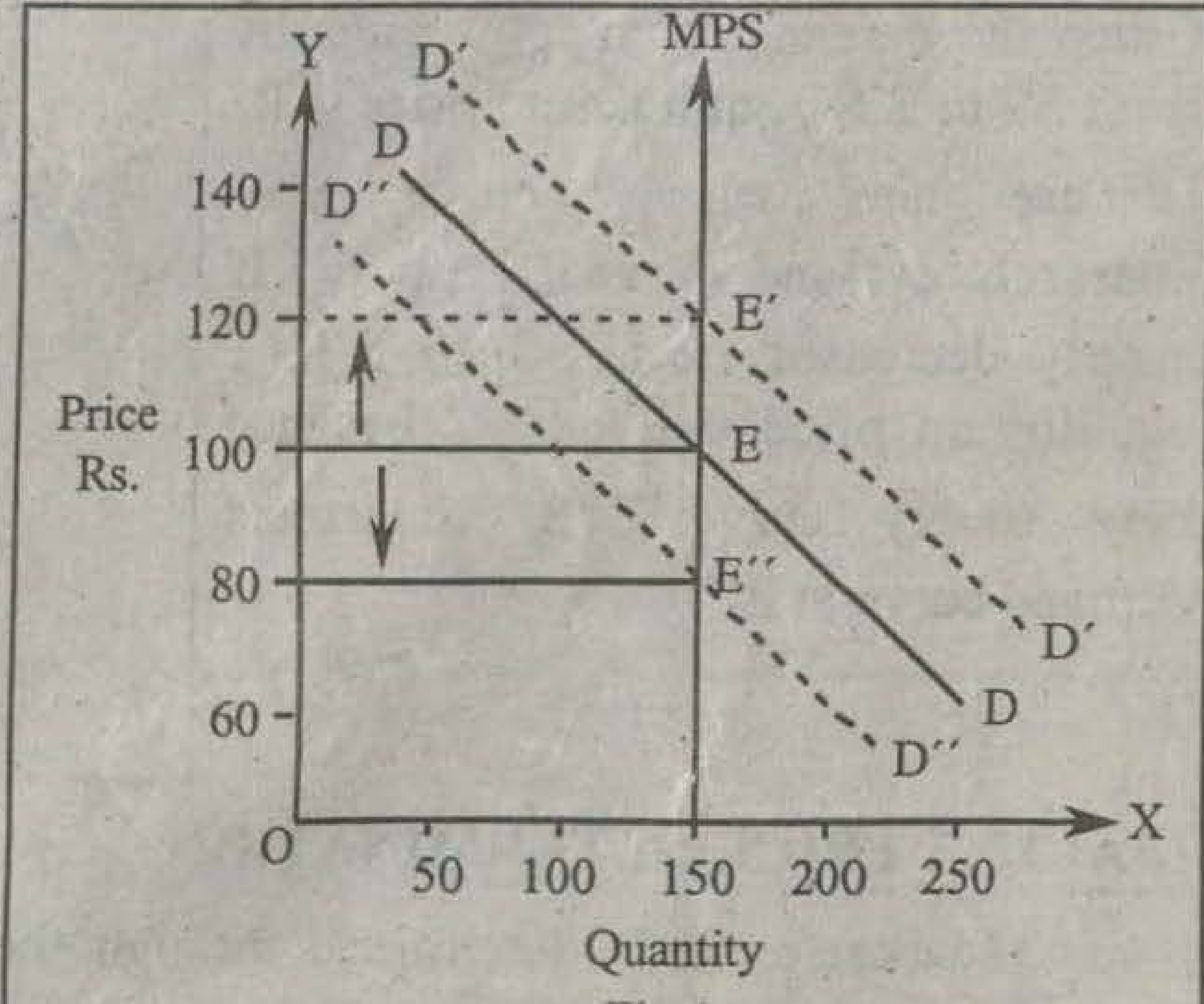


Fig.4

MARKET PRICE DETERMINATION-DURABLE GOODS

Market price for perishable goods is that where all the quantity offered for sale is purchased. But if the market price of durable goods falls from a certain price its supply is stopped and is kept back for the next day. It can be explained with the help of a schedule and a diagram.

Price Per Chair	Quantity Supplied	Quantity Demanded
400	10	50
500	20	40
600	30	30
700	30	20
800	30	10

It is clear from the schedule that demand contracts from 50 chairs to 10 chairs and quantity supplied 30 chairs but after that supply remained unchanged. Total number of chairs are 30. As chairs are durable so if the sellers do not get the reserve price they will stop the supply. In the schedule Rs. 600 per chair is the equilibrium price. If price falls from Rs. 600 to Rs. 500 only 20 chairs will be sold and if price increases to Rs. 700 even then supply will be 30 chairs because it has been assumed that supply in a day does not change. Increase in demand will only increase the price and decrease in demand will decrease the price.

In the diagram DD is the demand curve and MPS is the supply line. Quantity demanded and quantity supplied are equal at price Rs. 600 as shown by point E, hence, Rs. 600 is the equilibrium price. If demand increases from DD to D′D′, price rises from Rs. 600 to Rs. 700 and if demand decreases from DD to D″D″, price falls from Rs. 600 to Rs. 500.

The affect of the above can be shown with the help of diagrams.

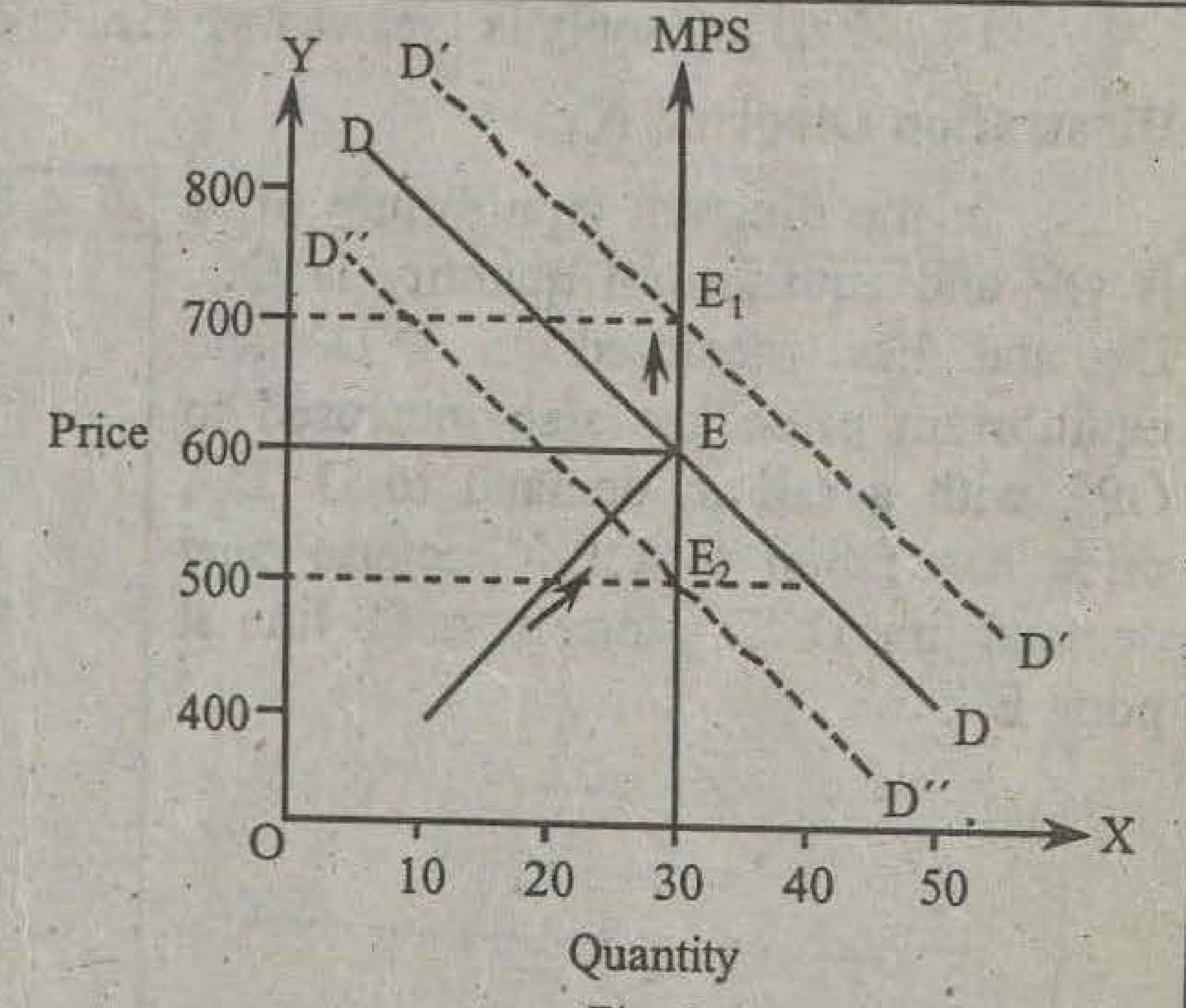


Fig. 5

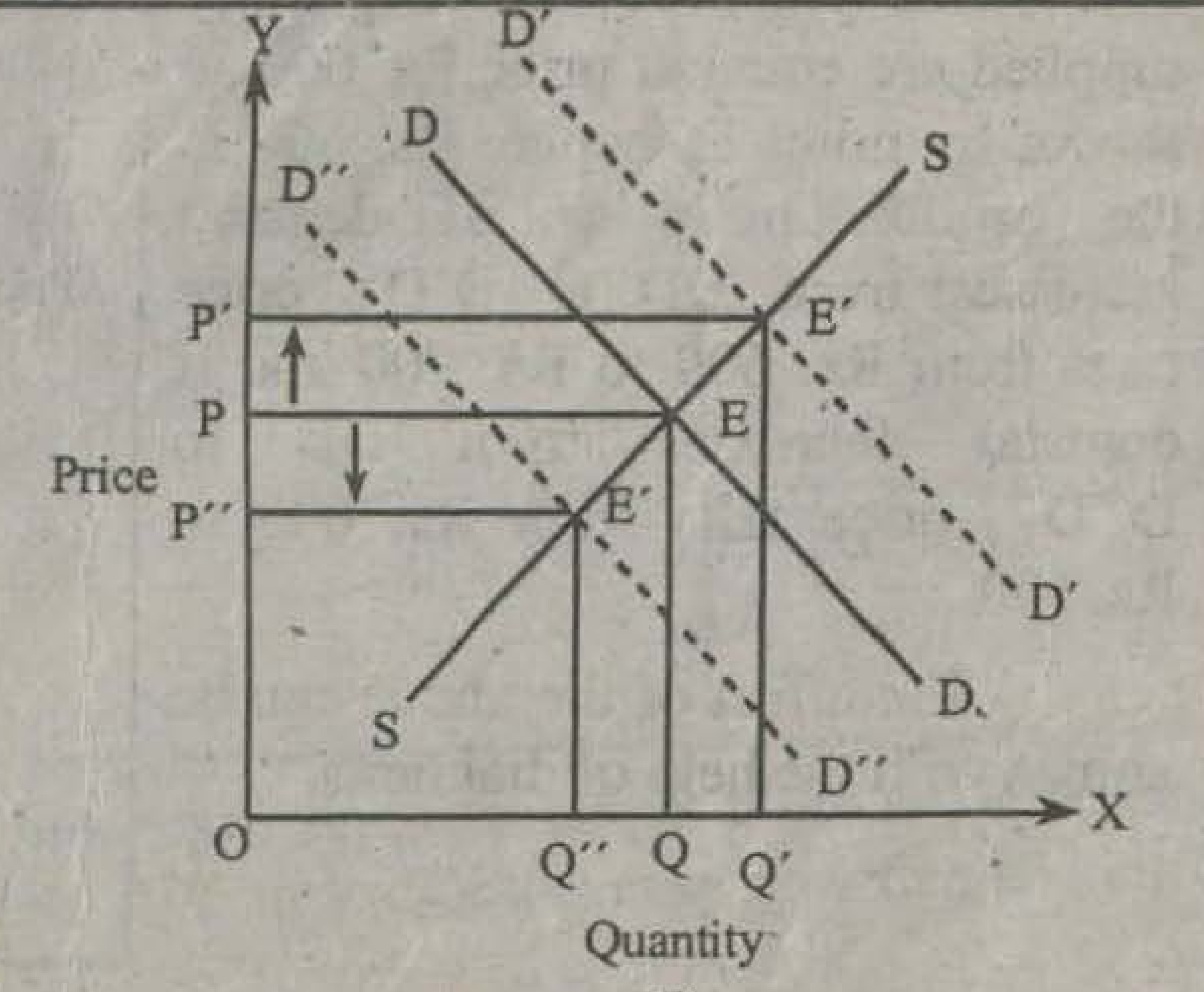
SHIFTS IN DEMAND AND SUPPLY AND EFFECTS ON EQUILIBRIUM PRICE

Shifts in demand and supply may affect equilibrium price in number of ways for example:

1. Rise and fall in demand, supply remains unchanged.
2. Rise and fall in supply, demand remains unchanged.
3. Equal rise in demand and supply.
4. Equal fall in demand and supply.
5. Equal rise in demand and fall in supply.
6. Equal fall in demand and rise in supply.
7. Rise in demand is greater than rise in supply
8. Rise in supply is greater than rise in demand.
9. Fall in demand is greater than fall in supply.
10. Fall in supply is greater than fall in demand.
11. Rise in demand is greater than fall in supply.
12. Fall in demand is greater than rise in supply.
13. Rise in supply is greater than fall in demand.
14. Fall in supply is greater than rise in demand.

Illustration Diagram No. 1:

In the diagram equilibrium price is OP and equilibrium quantity is OQ. Demand has increased to D′D′ and equilibrium price has also increased to OP′, with a fall in demand to D″D″, price has fallen to OP″ because new demand line D″D″ intersects SS line at point E″.



(1)

Illustration Diagram No. 2:

In the diagram equilibrium price is OP if supply increases to S′S′ then new equilibrium point is E′ and equilibrium price falls to OP′ if supply falls to S″S″ then new equilibrium point is at E″ and equilibrium price increases to OP″.

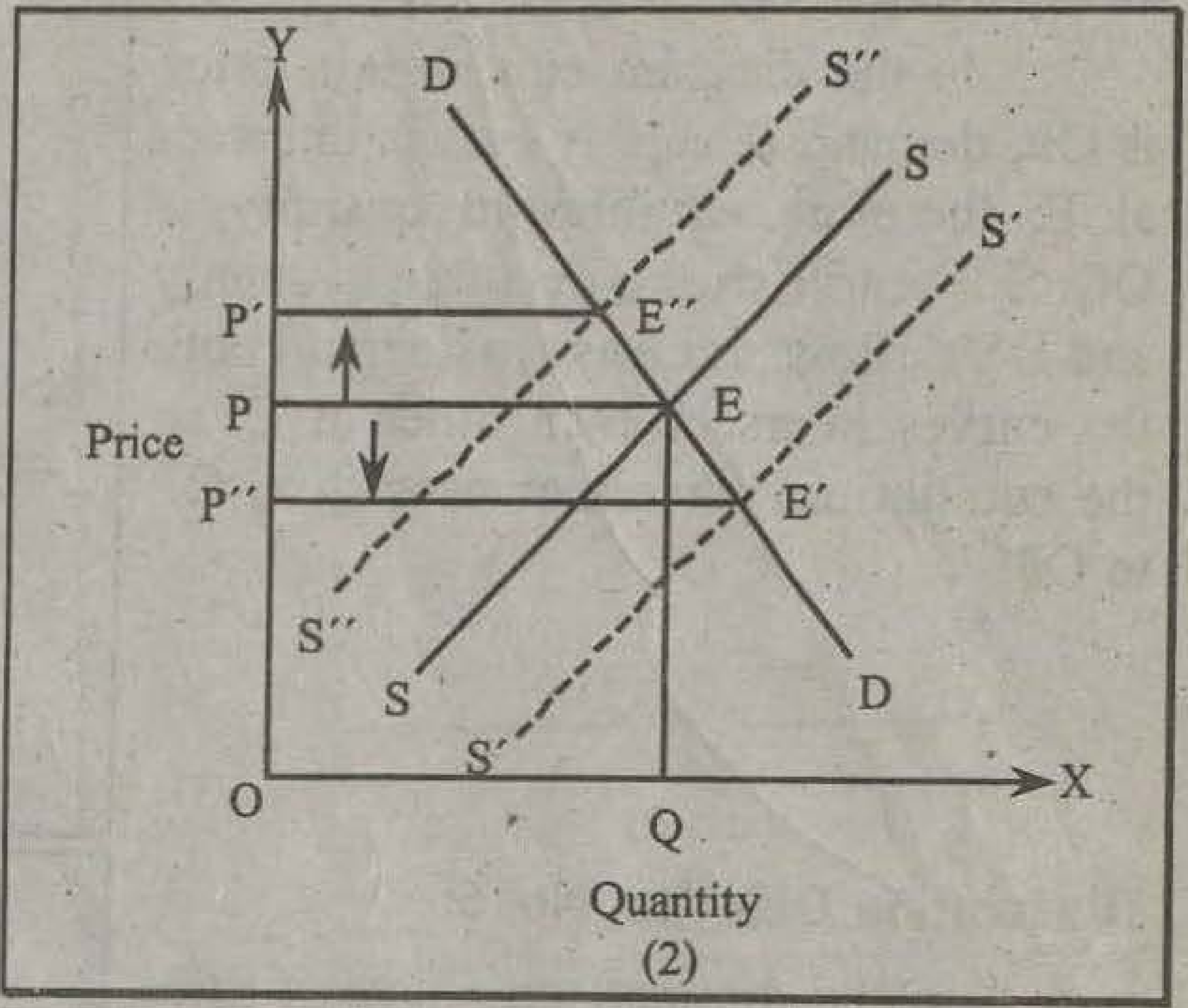


Illustration Diagram No. 3:

In the diagram demand and supply curves intersect at E therefore, equilibrium price is OP and equilibrium quantity is OQ. If demand increases to D′D′ and supply increases to S′S′ equilibrium price is unchanged but equilibrium quantity has extended to OQ′.

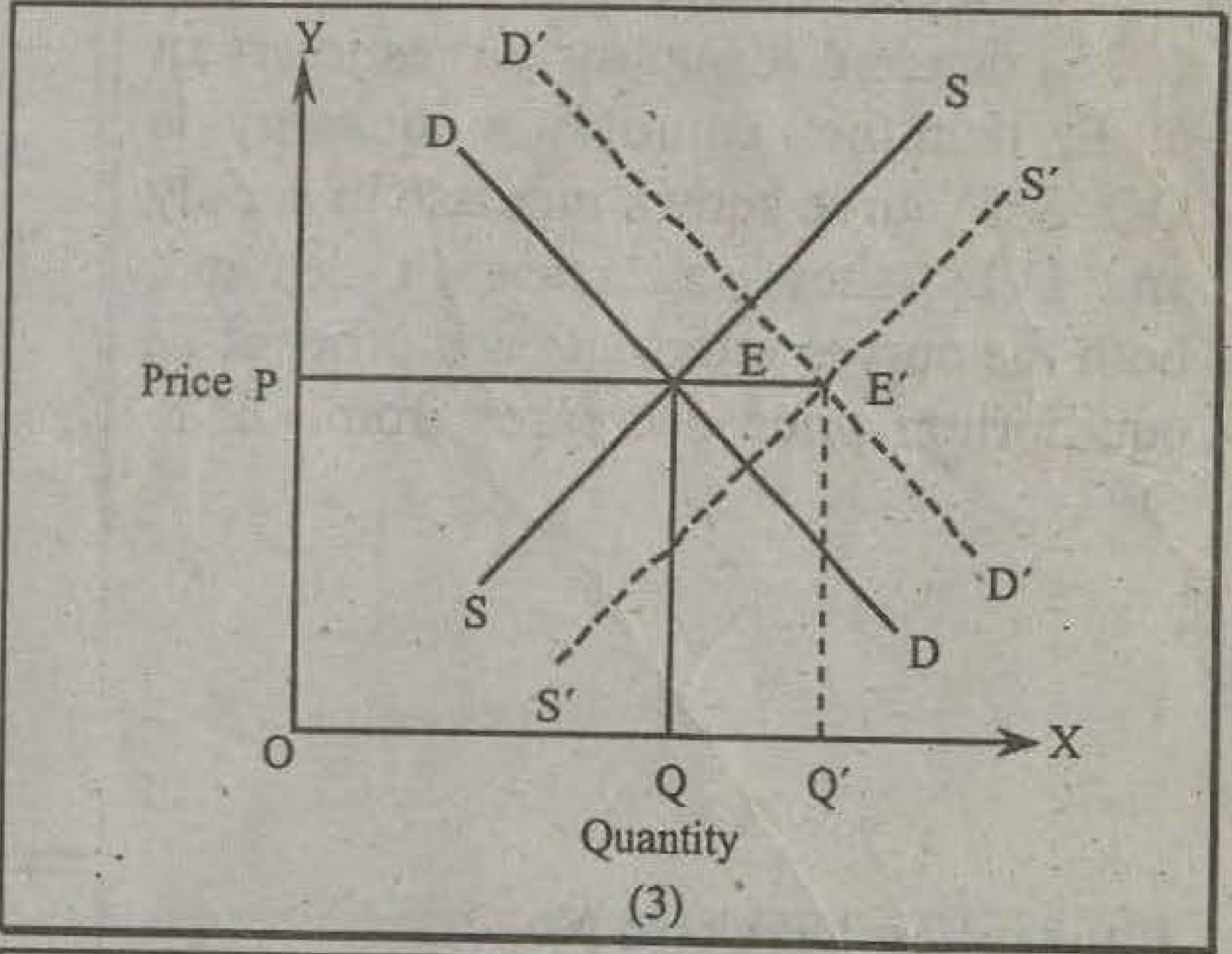


Illustration Diagram No. 4:

In the diagram equilibrium price is OP demand and supply curves intersect at E, therefore, equilibrium quantity is OQ. S′S′ curve shows decrease in supply and D′D′ shown decrease in demand, both the curves are intersecting at E′ which is parallel to earlier equilibrium price OP i.e., equilibrium price is unchanged.

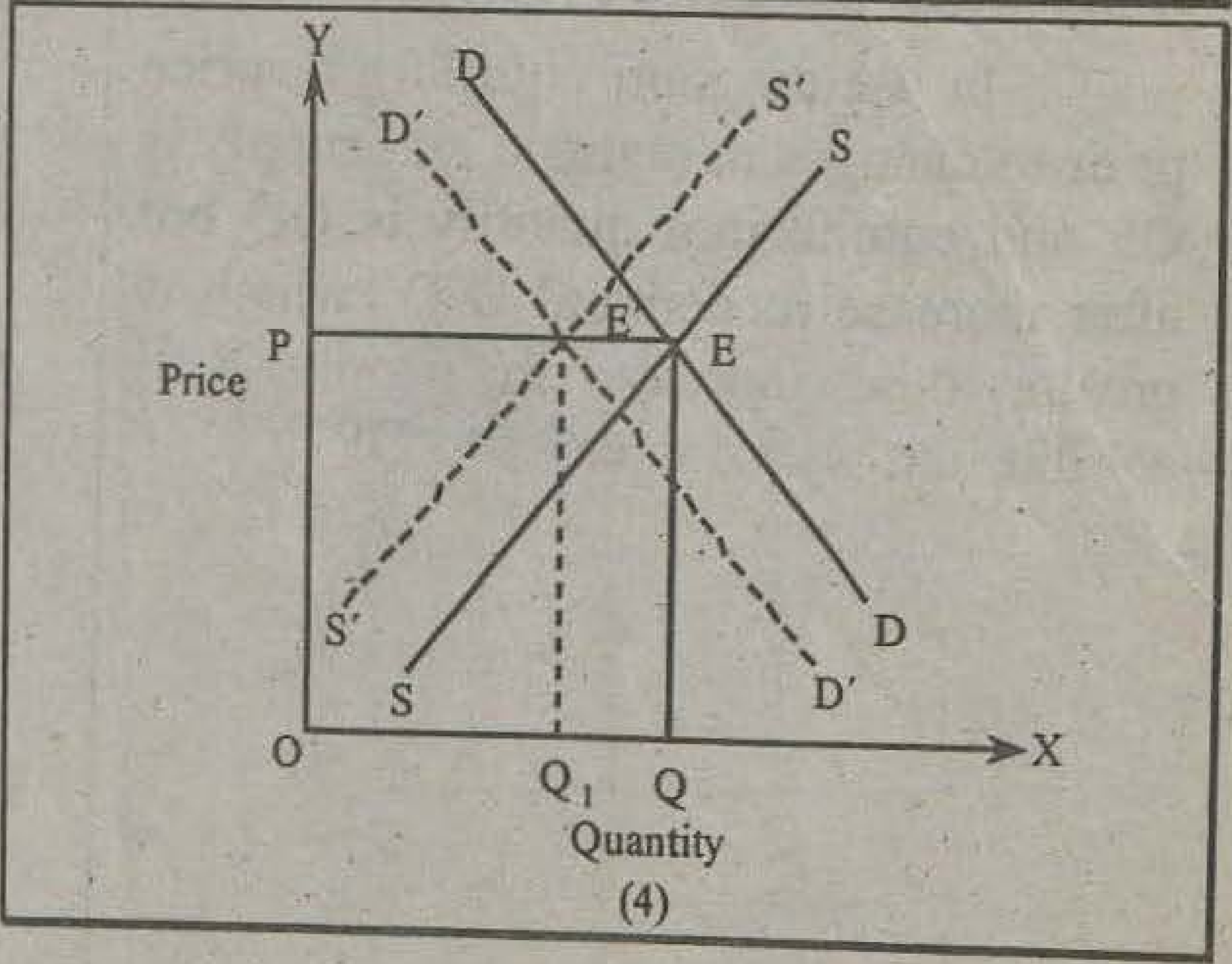
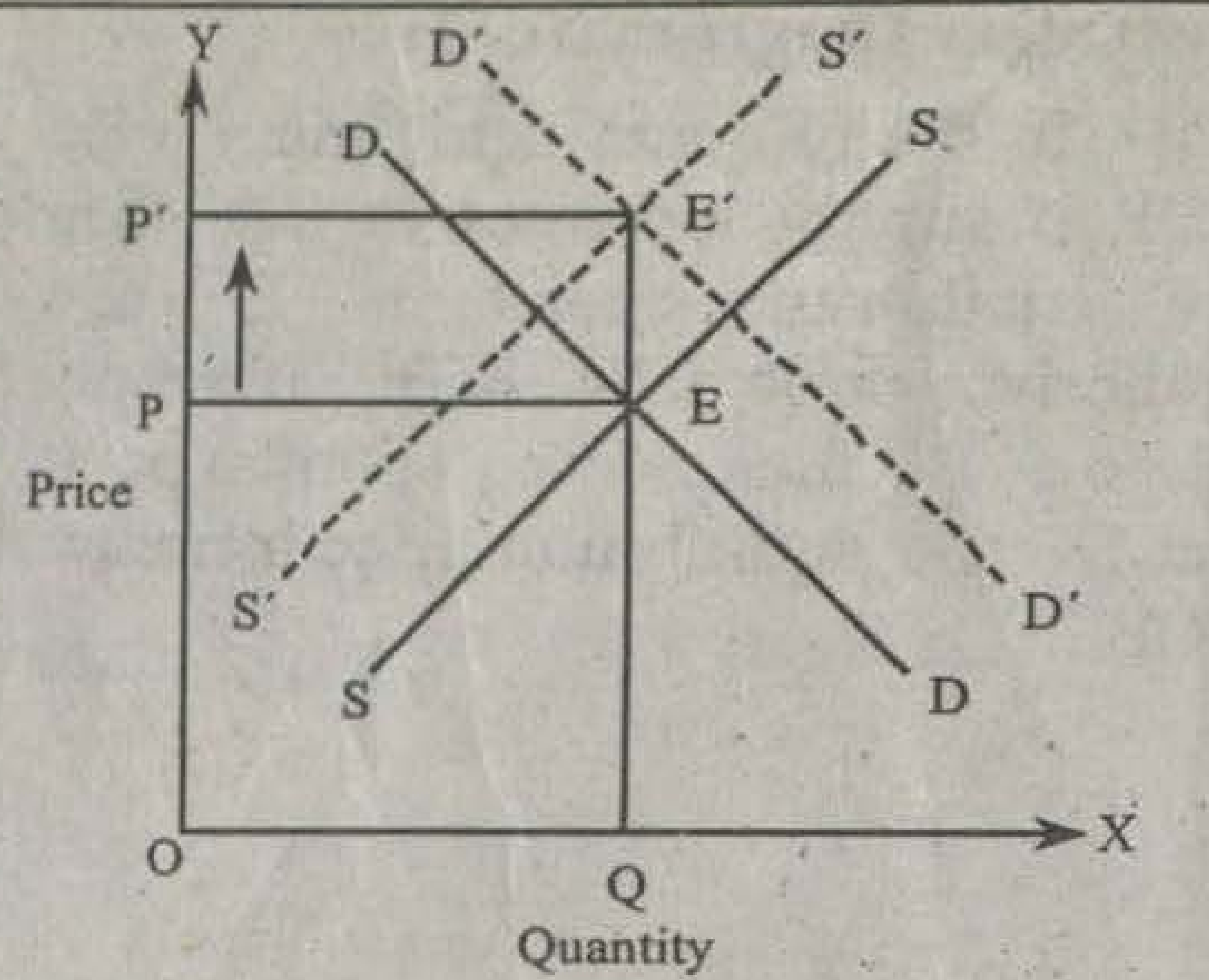


Illustration Diagram No. 5:

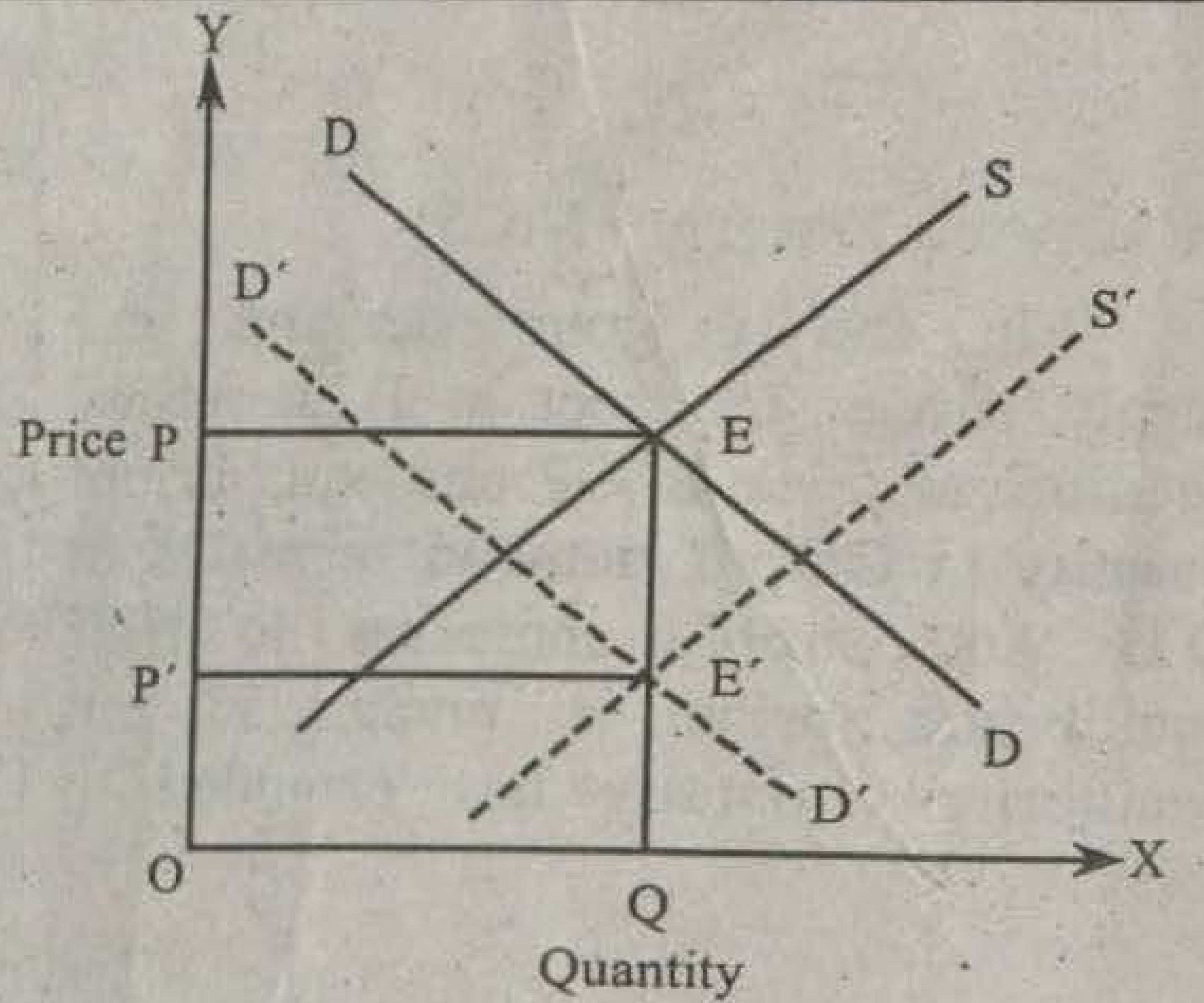
In the diagram equilibrium price is OP, demand & supply curves intersect at E, therefore equilibrium quantity is OQ. S′S′ curve shows decrease in supply and D′D′ shows increase in demand both the curves intersect each other at E′ so the equilibrium price increases from OP to OP′.



(5)

Illustration Diagram No. 6:

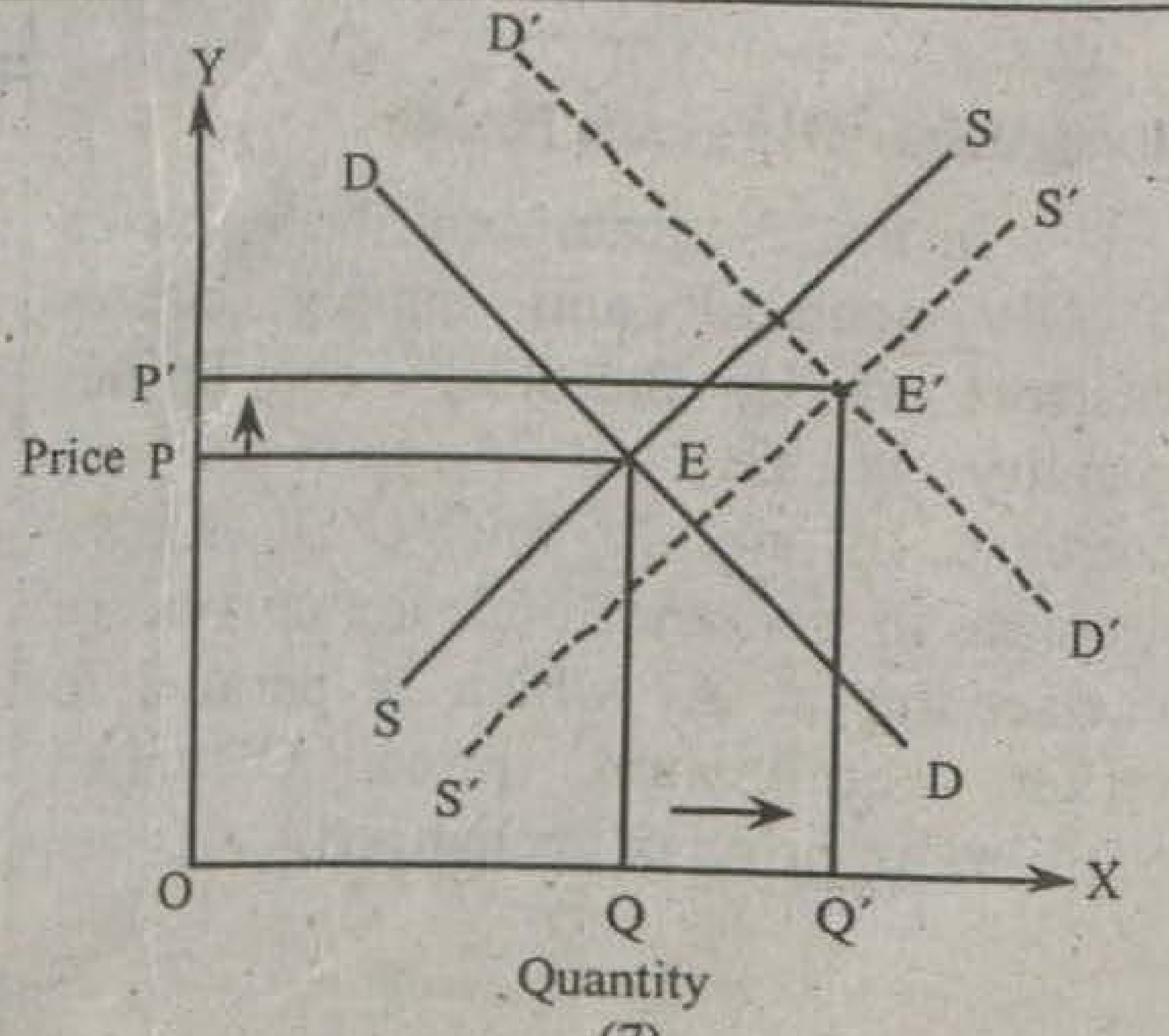
In the diagram equilibrium price is OP, demand & supply curves intersect at E, therefore equilibrium quantity is OQ. S′S′ curve shows increase in supply and D′D′ shows decrease in demand, both the curves intersect each other at E′ equilibrium price decreases from OP to OP′.



(6)

Illustration Diagram No. 7:

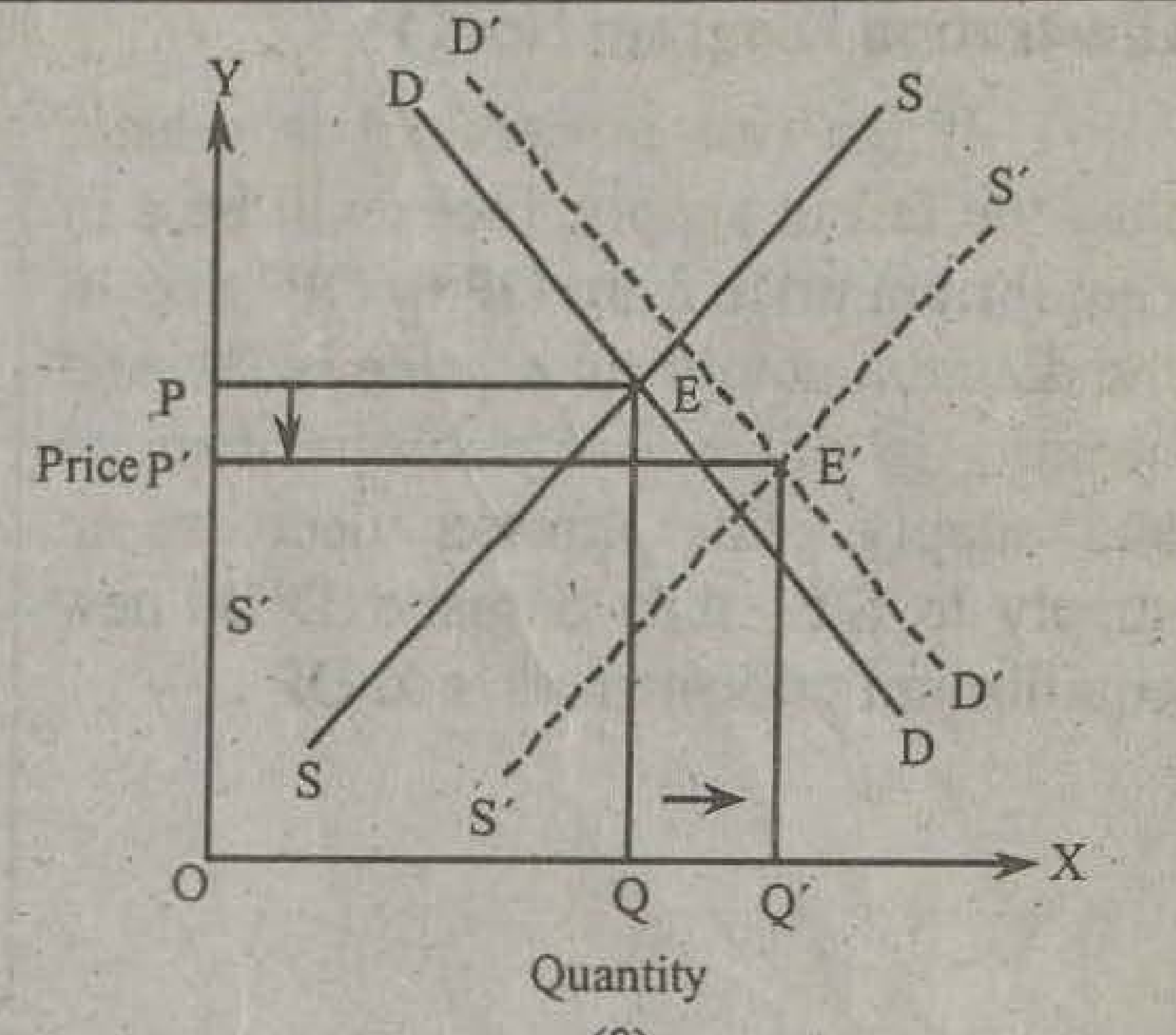
In the diagram equilibrium price prior to changes in demand and supply is OP and equilibrium quantity is OQ but after increase in demand D′D′ which is greater than increase in supply S′S′ equilibrium price increases to OP′.



(7)

Illustration Diagram No. 8:

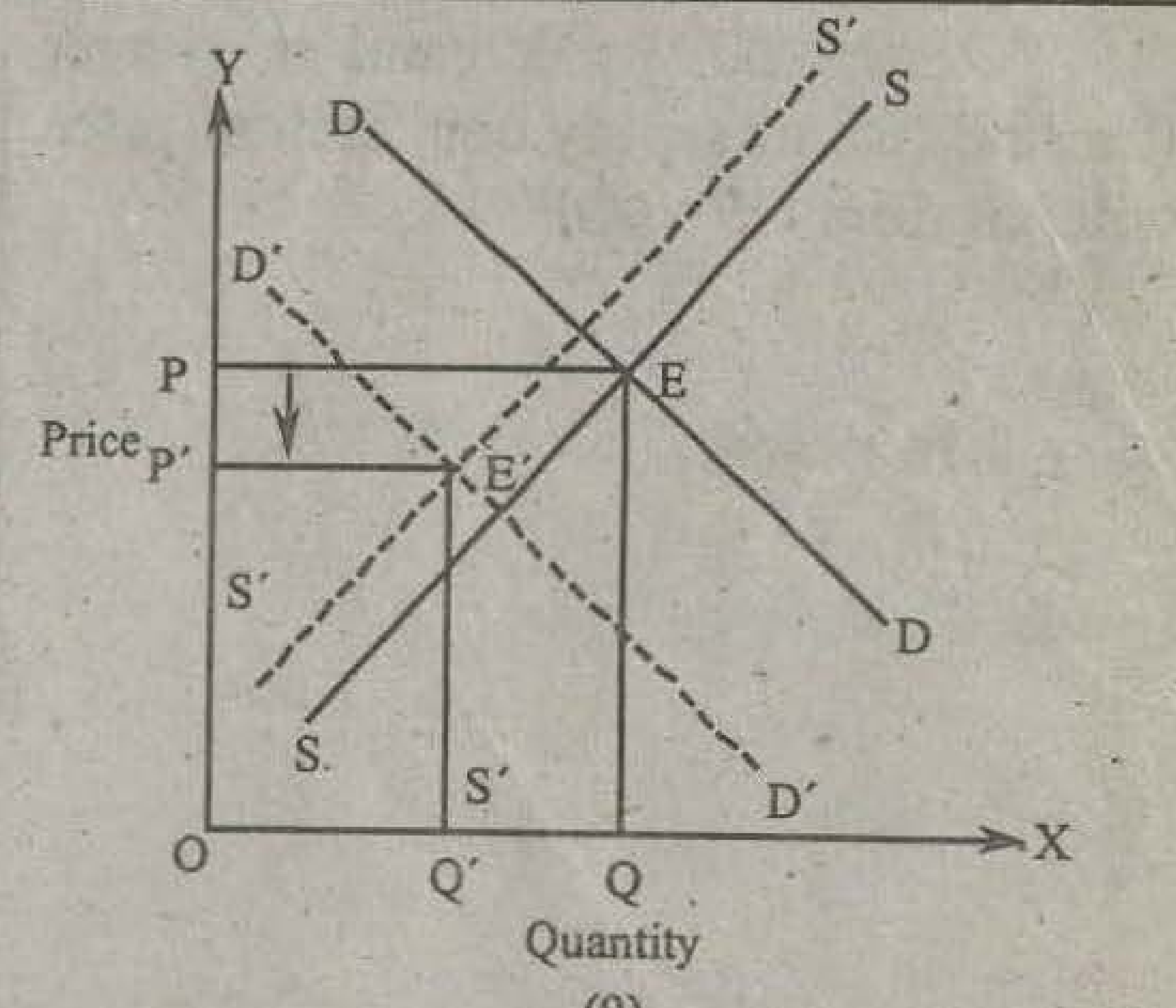
In the diagram equilibrium price and quantity before shifts in demand and supply are OP and OQ respectively. After an increase in supply S′S′ which is greater than increase in demand D′D′ and new equilibrium price is below the previous equilibrium price.



(8)

Illustration Diagram No. 9:

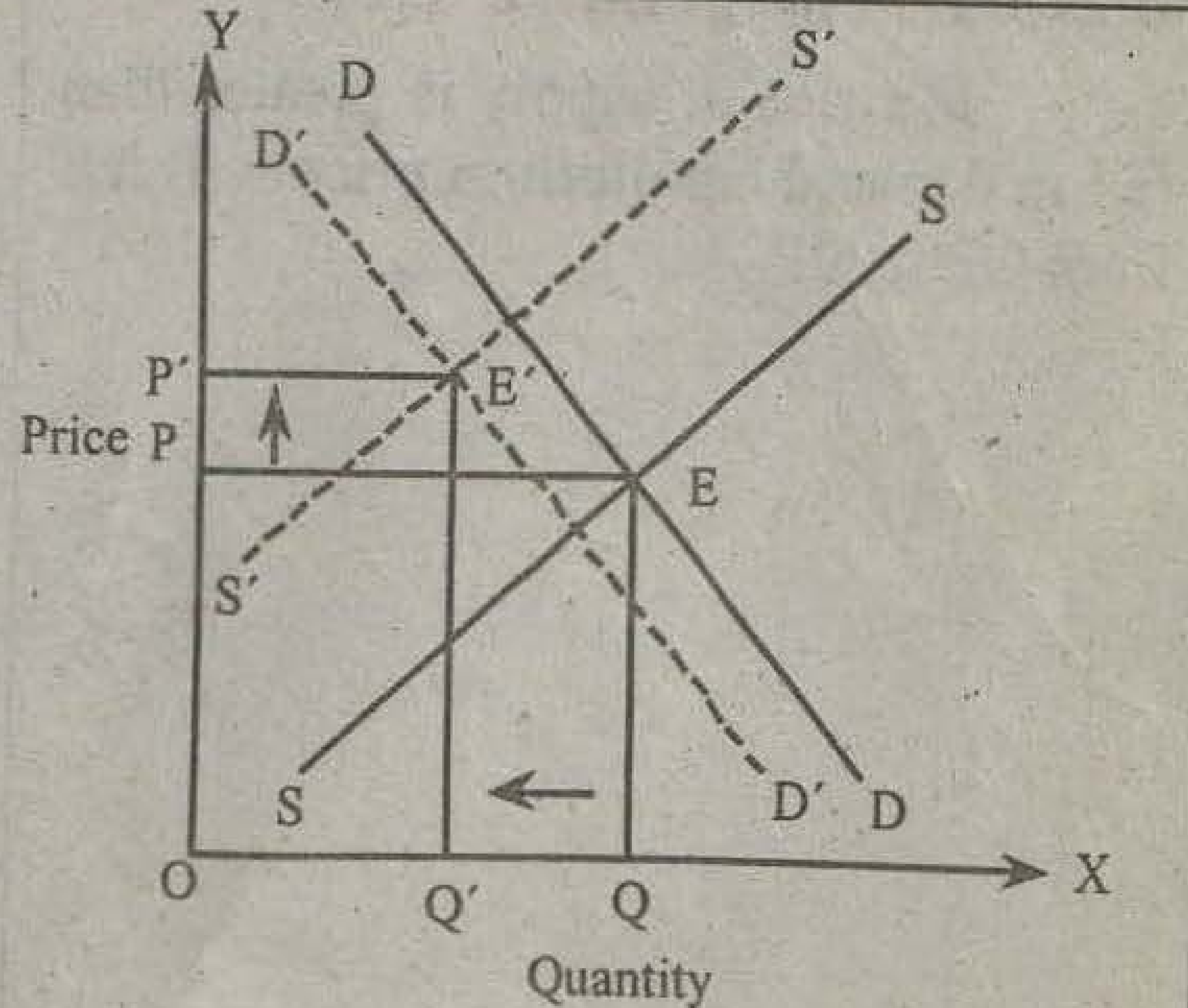
In the diagram original DD demand. Curve and SS supply curve intersect at E and equilibrium price is OP and quantity is OQ. New demand curve D′D′ shows greater decrease in demand than smaller decrease in supply S′S′ but both the new curves intersect at E′ and equilibrium price falls from OP to OP′ and quantity from OQ to OQ′. (Please show the curve OQ′ in the diagram).



(9)

Illustration Diagram No. 10:

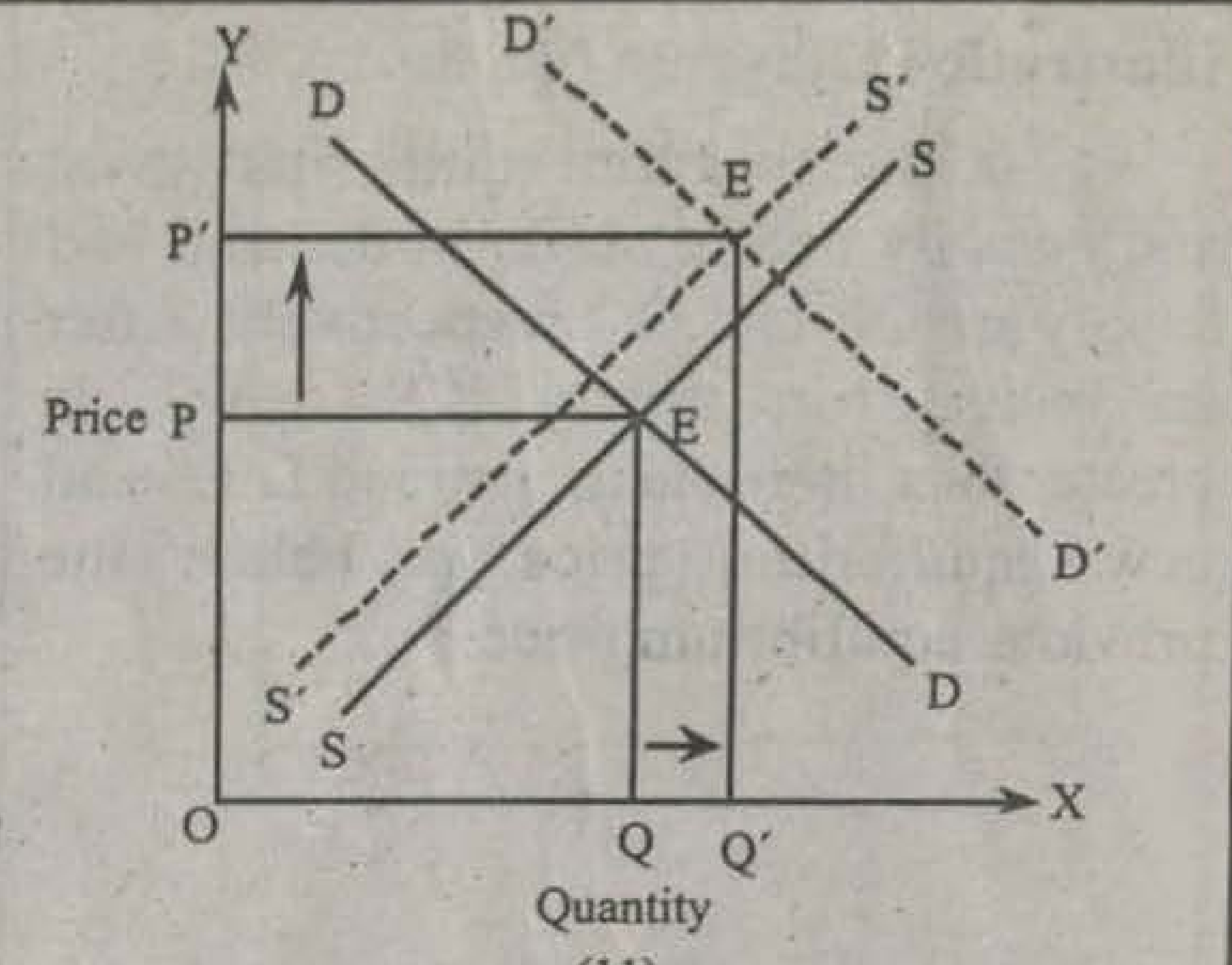
If a fall in supply is greater than fall in demand equilibrium price will increase from OP to OP′.



(10)

Illustration Diagram No. 11:

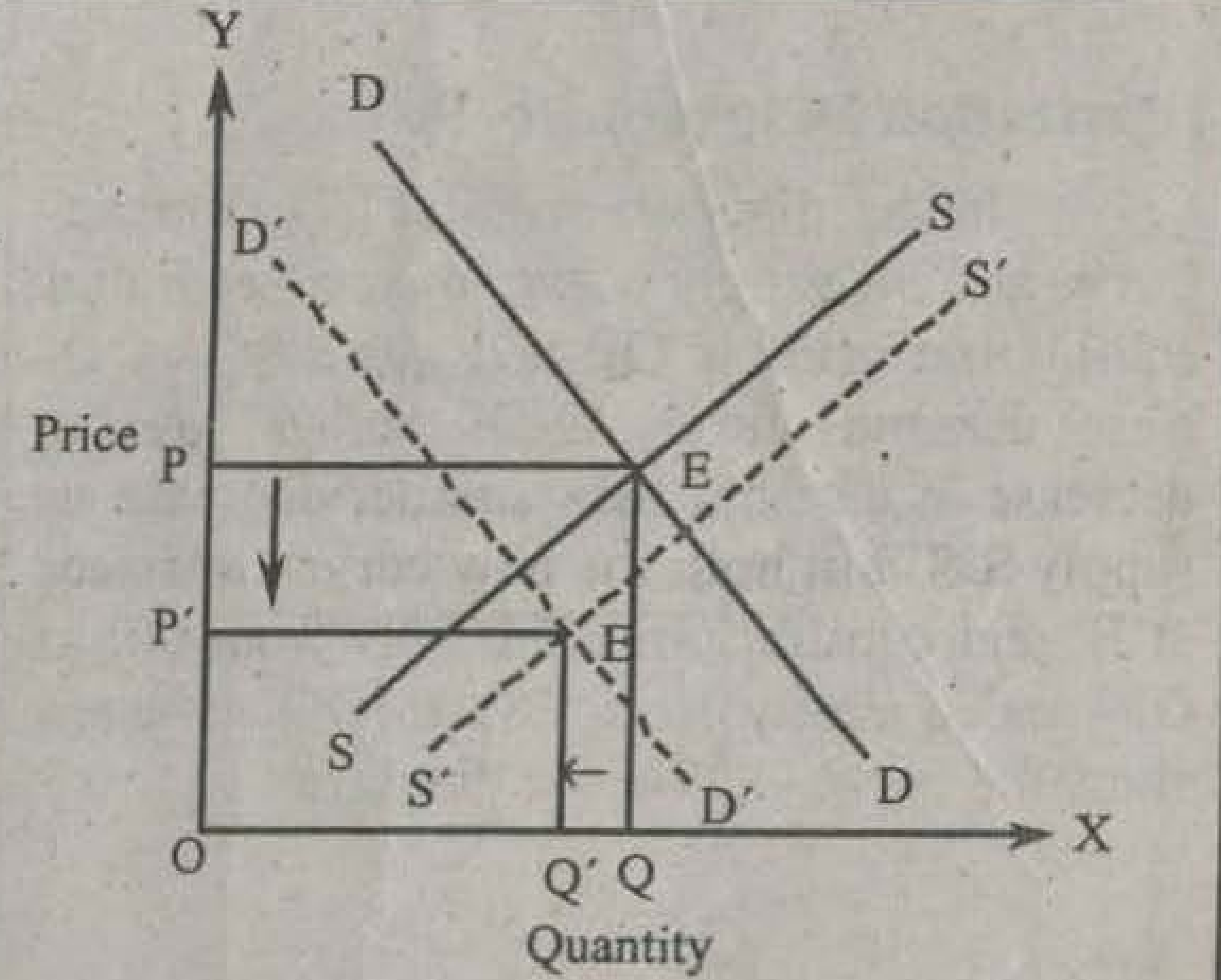
If the rise in demand is greater than the fall in supply, there will be a in equilibrium price from OP to OP′ rise. In the diagram equilibrium price is OP and quantity is OQ before shifts in demand and supply. After greater decrease in supply to S′S′ than demand D′D′ new equilibrium price increases to OP′.



(11)

Illustration Diagram No. 12:

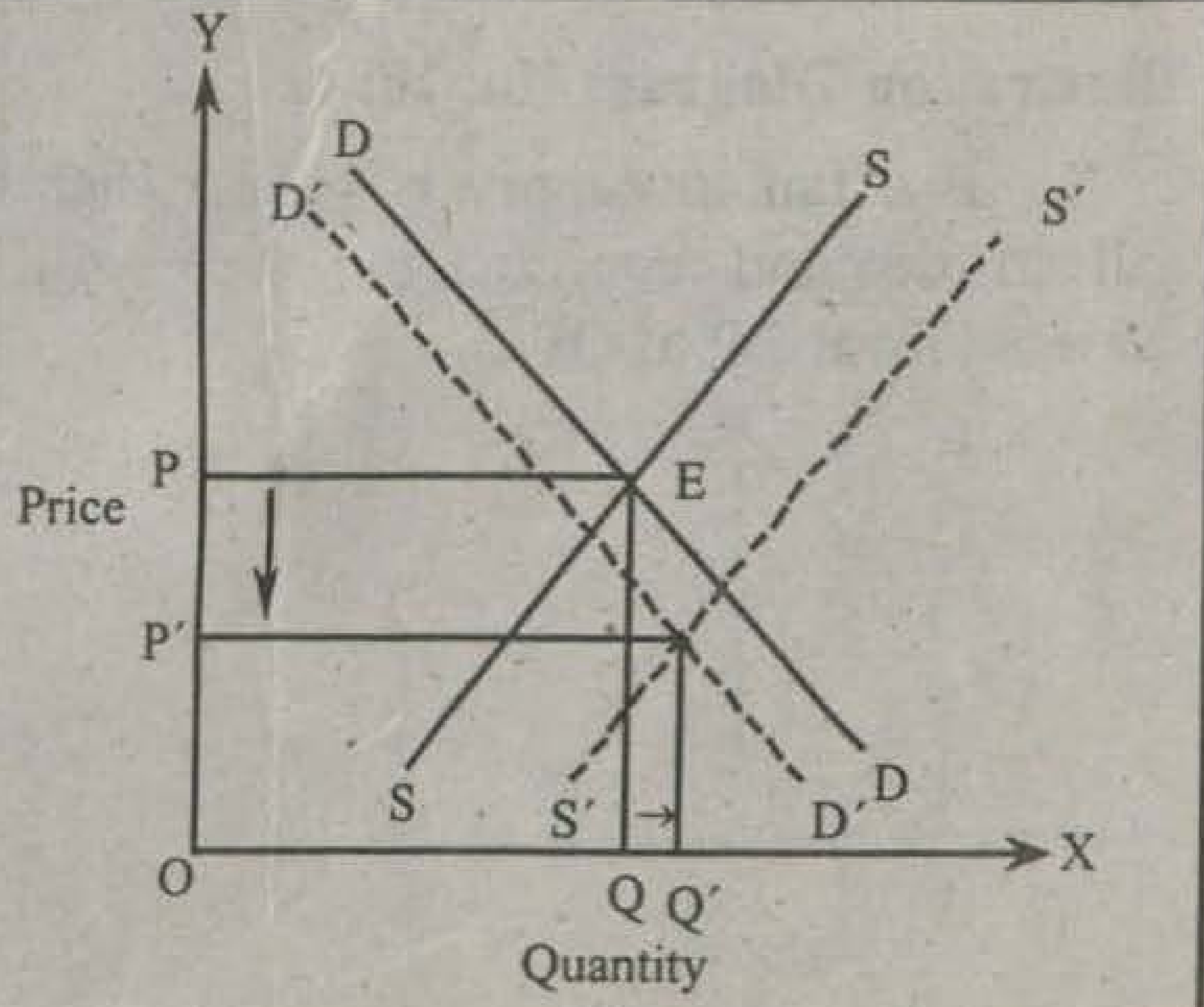
If the fall in demand is greater than the rise in supply equilibrium price will fall from OP to OP′.



(12)

Illustration Diagram No. 13:

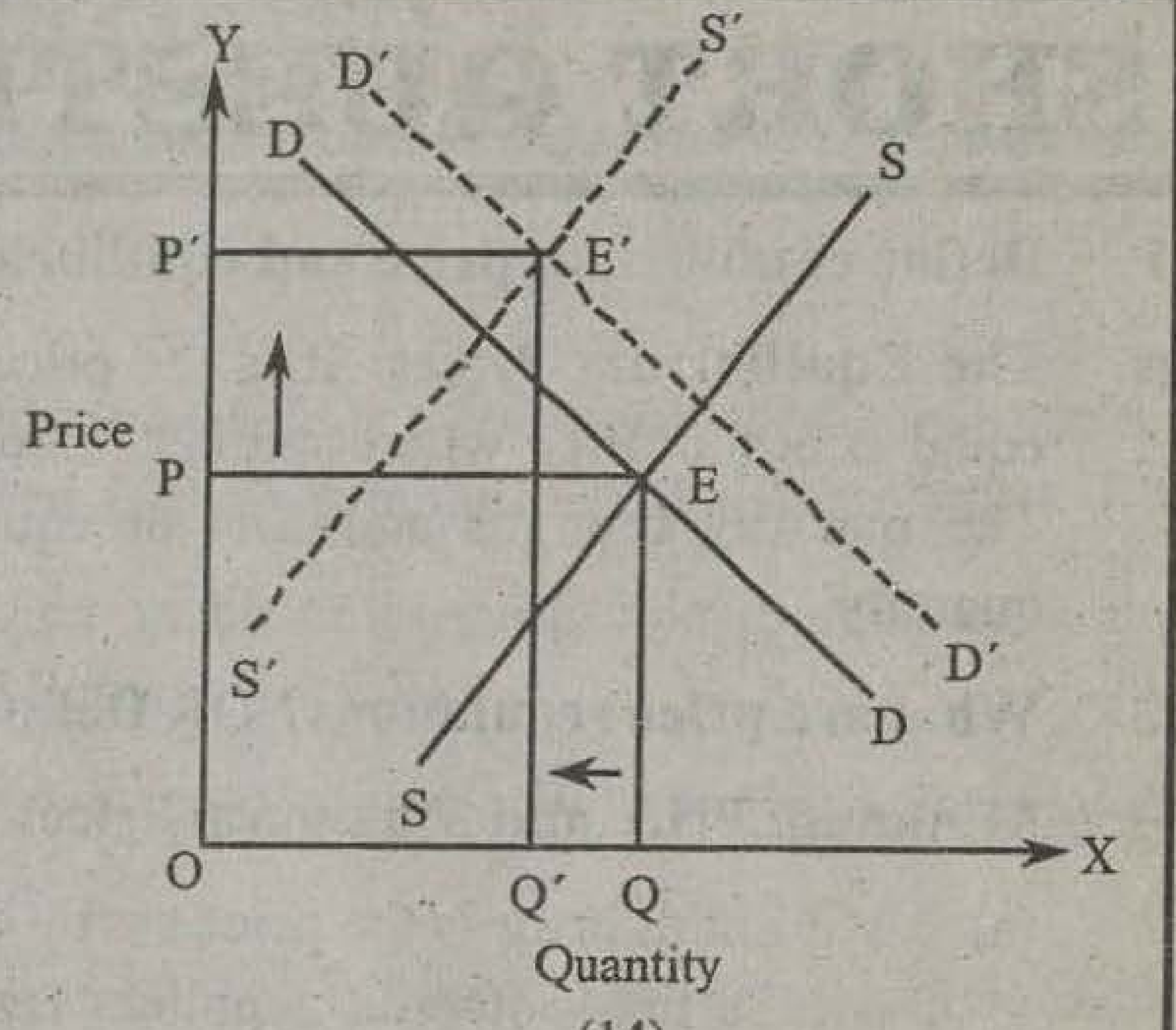
If a rise in supply is greater than fall in demand equilibrium price will fall from OP to OP′.



(13)

Illustration Diagram No. 14:

If fall in supply is greater than rise in demand, equilibrium price will rise i.e., from OP to OP′.



(14)

The forces of demand and supply which push to a market to its equilibrium price and quantity:

(a) There is generally market equilibrium i.e., equilibrium price and quantity will rule if demand and supply conditions do not change.

(b) If the market is in diequilibrium the demand and supply forces will push prices towards the equilibrium price.

(c) The market will be in disequilibrium when demand and supply curves change.

SHORT QUESTION ANSWER

Q.1 Define equilibrium price and equilibrium quantity.

Ans. The Equilibrium Prices: It is the price at which quantity brought and sold are equal it is the price where market forces i.e., demand and supply are just equal. The quantity brought and sold at equilibrium price is known as equilibrium quantity.

Q.2 What are price regulations? OR Define minimum price and maximum price?

Ans. Minimum Price and Maximum Price:

(a) Minimum price is the price set by the government or by private authorities to enoure that potential suppliers earn normal profits for each unit of output they sell.

Minimum prices are generally set to avoid the producers from exploitation because of excess supply or to avoid deflationary pressure in the economy.

(b) Maximum prices are set to save the consumers from exploitation because of excess of demand or to avoid and central rising prices or inflation in the economy.

Q.3 Differentiate between elastic demand and "inelastic demand".

Ans. Elastic and Inelastic Demand: When the percentage change in demand is greater than the percentage change in price the demand elasticity is said to elastic. If the percentage change in demand is less than the percentage change in price, the demand elasticity is said to inelastic.

Q.4 Write short note on perfectly elastic and perfectly inelastic demand.

Ans. Perfectly Elastic and Perfectly Inelastic Demand: When the buyers (ultimate consumers) want to buy unlimited amount of goods but upto a specific price level, the demand elasticity is said to be perfectly elastic. If there is no change in demand quantity to a change in price, the demand elasticity is perfectly inelastic.

Q.5 Define unit elastic demand.

Ans. Unit Elastic Demand: If proportionate or percentage change in demand is just equal to proportionate or percentage change in price, the demand elasticity is unit elastic or if the total revenue of the potential sellers is the same whatever the price.

EXERCISE

Q.1 Explain the term equilibrium price. How is equilibrium price determined under perfect competition. (OR)

Draw hypothetical supply and demand schedules for a commodity and show that the market is cleared at the equilibrium price. Explain with the help of diagram. (OR)

"Through demand and supply production becomes profitable to producers and price acceptable to the consumers". Discuss. (OR)

What are the salient features of perfect competition? How is price determined under perfect competition?

Q.2 What do you understand by the market price? How market price is determined? (OR)

Show how market price is determined under conditions of perfect competition. (OR)

Show how market price is determined under conditions of perfect competition. (OR)

Show with the help of schedule and a diagram the determination of market price. (OR)

What is market period and market price? How price of fish, vegetables or milk is determined through demand and supply. (OR)

How price of perishable goods is determined?

Q.3 Show the effects of shifts in demand and supply on equilibrium price. (OR)

What is the affect of the following on the equilibrium price.

(i) Change in demand supply remaining unchanged.

(ii) Change in supply, demand remaining unchanged.

(iii) Equal rise and fall in demand and supply but in the same direction.

(iv) Increase in demand greater than increase in supply.

(v) Increase in supply greater than increase in demand.

Q.4 Drive the functional equation of supply. Explain the supply equation $Qs = 5 + 5p$ with the help of the schedule and diagram?

Q.5 Given the following demand and supply equations:

(i) $Qd = 30 - 2P, \; Qs = 15 + 3P$

Find the equilibrium price and quantity and show with the help of schedule and graph.

Q.6 Gives the demand and supply equations:

(i) $Q + P = 5$ (ii) $2P - q = 5.5$

(a) Indicate demand and supply equations.

(b) Find equilibrium price and quantity.

(c) Show with the help of a schedule and diagram.

Q.7 Write short note on the following:

(i) Consumer surplus producers surplus.

(ii) Minimum price and maximum price.

(iii) Guaranteed price and deficiency payment scheme.

✿ ❹ ✿

CHAPTER 5

SCALE OF PRODUCTION AND LAWS OF RETURNS

WHAT IS A FIRM

A firm is a decision making unit, which has the power to make decision within the areas under its control, i.e., a person or group of persons who start business, manage it and take responsibilities. The basic aim of the firm is to maximize profits. A firm can maximise its profits in three ways:

1. By Increasing the Selling Price

In this way firm can maximise its total revenue and the difference between total cost and total revenue is widened. But this method is not free from danger. There is a possibility of contraction in demand as price increases and total revenue instead of increasing may decrease.

2. By Decreasing Cost of Production

A firm can maximise profit by decreasing cost of production but the firm has to change the method of production i.e., it has to adopt new and better means of production.

3. By Decreasing Selling Price

A firm can increase its total revenue by decreasing selling price because decrease in price may cause extension in demand. But price can be decreased upto some extent and below the normal profit, price cannot be decreased. So the best way is to minimise cost of production.

BASIC PROBLEMS OF A FIRM/FACTORS/CONDITIONS

1. Choice of Industry

Every firm faces the problem of choice of industry. It has to decide in which industry to invest because the basic aim of the firm is to maximise profits so the industry in which more profits are possible i.e., demand for goods is greater and profits are high.

2. Choice of Place

The second problem is the choice of place for the factory. For this purpose it is analysed whether the raw material is available or not, power i.e., electricity or gas to run the machinery is available or not, whether necessary labour force is available? and the markets are near. The means of transport and communication are developed and swift or not.

3. Choice of Scale of Production

Another problem for the firm is the choice of scale of production. Scale of production may be larger or smaller. Both the scales have merits and demerits. It will adopt that scale of production which maximises its profits. The choice also depends upon the financial resources of the firm, ability and experience of the organiser, extent of the market and nature of work.

4. Decision of Output

Firm has to decide what amount of output should be produced. It will produce that quantity of output which maximise its profits and minimize cost of production. Firm's profits are maximum where marginal cost is equal to marginal revenue.

5. Factors Combination

A firm tries to maximise its profits and for this purpose it has to decrease its cost of production. Firm faces the problem of choice of method of production i.e., choice between labour intensive and capital intensive methods. It will adopt that method which minimize its cost of production.

Note: Profit maximisation is the generally goal of a sole proprietorship firm and it may not be the objective of a public limited company owned by shareholders and run by non-shareholding owners.

The objectives other than profit maximisation by the firms which are owned by the paid managers for decision making may be as follow.

The profit level must be satisfactory and so acceptable to shareholders, and must provide sufficient retained profits for future investment for expansion.

Satisfying is the term used for achieving satisfactory level of profits instead of profit maximisation.

There are following managerial theories regarding objectives other than profit maximisation:

1. Williamson's Management Discretion Model

The model states that utility, which a manager intends to maximise **is a function of the manager's** own salary and also expenditure on his staff, the amount of prerequisites or '**Perks**'.

2. Baumol's Sales Maximisation Model

The model states that a firm might opt for sales revenue maximisation in order to maintain or increase its market share, ensure its existence and avoid competition.

3. Cyert and March's Organisational Coalition Model

According to Cyert and March a firm is an organisational coalition of shareholders, employees and customers, wherein each group has different objectives and therefore, there is a need for political compromise in determining the objectives of the firm. Each group must accept for less than it would ideally want to have shareholders should accept less than maximum profits and managers for less than maximum total utility.

Accounting Profits and Economic Profits

Accounting profits are equal to the sales revenue minus explicit costs of the business e.g., material costs, labour costs, depreciation costs and refits etc. while the economic profits consist of total sales revenue minus explicit costs minus implicit costs or economic profits are equal to accounting profits minus implicit costs.

SCALE OF PRODUCTION

By scale of production we mean, what should be the level of production i.e., what quantity of output should be produced. The quantity of output influences the profit, if its profits are maximised at small scale of production the firm shall produce on small scale of production otherwise firm will produce at large scale.

DETERMINANTS OF SCALE OF PRODUCTION / FACTORS INFLENTING SCALE OF PRODUCTION

1. Financial Resources

Scale of production depends upon the financial resources of the entrepreneur. If the entrepreneur has less resources he will be forced to start production on small scale because of in ability to purchase new and modern machinery and excessive quantities of raw material. But if the entrepreneur has much resources or he is able to get credit from the banks or financial institutions easily then he will start production on large scale.

2. Ability of Entrepreneur

If the entrepreneur is educated and has vast experience of managing business, he may start production on large scale and if he is not educated and had little experience about the business management, he cannot start production on large scale.

3. Technical Possibilities

Scale of production also depends on the method or technique of production. Generally there are two methods of production.

(a) Labour intensive method

(b) Capital intensive method

If the method of production absorbs less capital and more labour that method is called labour intensive but if the production method absorbs more capital and less labour then it is capital intensive method. If entrepreneur adopts simple method (labour intensive) then scale of production will be small and if he adopts capital intensive method, the production will be on large scale.

4. Nature of Work

Scale of production also depends on nature of work, some types of businesses are beneficial on small scale i.e., business of goldsmith, and zargari etc.

5. Extent of Market

If the market for a product is vast i.e., its demand comes from far off places and in large quantities, large scale of production is beneficial and if the market is limited i.e., goods are sold and purchased locally then small scale of production is beneficial.

6. Means of Transportation and Communication

Means of transportation and communication also determine the scale of production. If these means are developed and swift (i.e., from factories to market) then scale of production may be large otherwise the scale of production is small.

ECONOMIES OF LARGE SCALE PRODUCTION

Following are the merits, advantages OR economies of large scale production:

1. Economies of Buying and Selling

The large scale producer purchases raw material in larger quantities and from the areas where its supply is larger and price is low and therefore secure favourable terms on account of its large purchases. He sells its product in the markets where its demand is greater and price is high.

2. Optimum use of Machinery

Most of the goods of daily use are produced with the help of modern machinery which produces larger quantities, of superior quality with lower cost. But modern machinery can be used only by large scale producer.

3. Division of Labour

Division of labour helps in increasing efficiency of labour. Efficient labour can produce larger output and of better quality. But division of labour is only possible in large scale.

4. By-Products

In large scale of production waste is not thrown away but it is utilised for production of by-products which lowers the cost of production e.g., a big sugar mill does not throw away the waste, but converts it into hard-boards and etc.

5. Economies of Overhead Charges

Overhead charges do not change with the output. Overhead charges per unit of output decreases with an increase in output so the expenses of administration and distribution are much less in large scale production, that results in lower per unit cost.

6. Economies of Repair or Workshops

Large scale producer being financially strong establishes workshops within the factory hence, production process continues without any break and expenses of repair are much less.

7. Analysis of Market Fluctuations

Market fluctuations mean changes in the price level. The organisers who foresee these fluctuations benefit and for this purpose large scale producer employs capable and experienced marketing managers who survey the demand and supply positions in different markets and help the large scale producer in earning maximum profits.

8. Facing the Adversity

A large concern can face the adversity and depression in a better way because of his vast resources. He can bear losses even for a longer period in a hope to earn profits in future.

9. Advertisement and Salesmanship

In the present times none of the firms can introduce its products without the advertisement and salesmanship. Only a large scale producer can spend heavy amounts on advertisement and salesmanship. Thus, he captures, the market and increases its revenue.

10. Cheap Credit

Govt. provides more concessions e.g., income tax holiday, exemption of excise duty and low custom duties on import the large scale producers also gets credit facilities at a cheaper rate. Low costs of credit reduces the cost of production and maximize the profits.

11. Research and development (R & D)

It is admitted that expenses of development and research repay more. Successful research and development may lead to a cheap method or technique of production which in the long run reduces cost of production. But only large scale producer can afford the expenses of research and development.

DISECONOMIES OF LARGE SCALE PRODUCTION

1. Over Worked Management

The large scale producer is mostly involved with import and export problems, concessions from the govt. and attainment of cheap credit. Supervision becomes relaxed and there is a wastage of raw material, leakage of finished goods, mishandling of machinery, inefficiency of labour, dishonesty etc., and this appears when concern grows.

2. No Personal Element

As the concern grows personal contact between the employer and employees disappear. The owner is usually absent. The business is generally managed by paid employees. Personal contact and sympathy between the employers and the employees are missing and this sometimes leads to misunderstanding, strikes and lock up of the factory which is harmful for the business.

3. Individual Tastes are Ignored

Large concerns are run with huge and most modern machinery which only turn out standardised goods and control the quality. The large quantities are produced hence, individual tastes, traditions and customs are ignored.

4. Danger of Depression

If at any time in large scale production supply is greater, then the demand price goes down, profit rate goes down and if production is stopped there is a danger of depression because of unemployment.

5. Dependence on Foreign Markets

Large scale producers import raw material and machinery. If the supply of raw material is cut off by war or due to political unrest in the exporting countries, production process is disturbed. This makes the business risky.

6. Over Production / Cut Throat Competition

Large scale producer have the desire to increase output to earn more profits. They fight for the markets and there is a wasteful competition and as a result there may be over production and all the firms may face losses.

7. Lack of Adaptability

Large scale production in adversity or in depression finds it very difficult to switch over from one business to another.

8. Danger of Monopolies

Large scale producers do not allow the small scale producers to enter into the business and if enter, large scale producers lower down price per unit of output than the cost per unit of small scale producer and hence, become monopolist and earn super normal profits.

ADVANTAGES OF SMALL SCALE PRODUCTION

The merits of small scale production are as follows:

1. Personal Element

In small scale production, the small scale producer has personal contact with the employees. He can supervise his business himself so those businesses which require personal supervision can only be established at small scale. Due to personal supervision, production increases and the possibility of dishonesty of the labour is minimum therefore, cost of production does not increase.

2. Direct Relations with the Consumers

The goods produced in small scale are generally sold in the nearer markets therefore, he does not ignore individual tastes and customs of the people.

3. Better Relations with Labour

In small scale production the number of workers are not large therefore, personal relations develop with the labour and a kind word is thrown now and then which rules out the possibility of strike or any other trouble. He understands their problems and try to solve them and as a result, labour work hard.

4. Prompt Response to a Change in Demand

Another advantage of small scale business is that he can increase or decrease its production according to rise or fall in demand easily.

5. Prompt Decisions

Small scale producer is capable of prompt and quick decisions about the output, supply, demand and price. There is no divided responsibility. He is the sole producer so he finds no difficulty in taking quick decisions.

6. Better Distribution of Wealth

The small scale business can be started with smaller amount of capital therefore, small businesses are established which increases circulation of money and removes concentration of wealth.

7. Does not require Complicated System of Accounts

The small scale business does not require complicated system of accounts there is a strong check to prevent fraud or waste of labour or material.

8. Non-dependence of Foreign Markets

The small scale manufacturer purchases raw material from the domestic markets and sells its product in the domestic markets hence, he is free from external effects and runs business without any fear.

9. Adaptability

The small scale producer can easily switch over to another business because he is the sole proprietor and need not to consult with his partners or share-holders.

10. No Danger of over Production

As the smaller quantities are produced and there are large number of producers so there is no danger of over production and monopolies.

DISADVANTAGES OF SMALL SCALE PRODUCTION

The demerits of small scale production are following:

1. Disadvantage of buying and Selling

The small scale manufacturers buy small quantities of raw material and sells its product in the nearer markets hence, do not enjoy the economy of buying and selling.

2. Disadvantage of Division of Labour

As the small number of labour is employed hence, he can not benefit the economy of division of labour.

3. Disadvantage of by Products

As the financial resources of the small scale producer are limited so he can not use its waste for making by products and has to throw it away.

4. Use of Modern Technology

Lack of financial resources not allow him to use most modern machinery so, he cannot increase the quantity of output, and cannot improve the quantity of its product.

5. Cannot Face Adversity

Due to lack of financial resources he cannot face adversity. He cannot bear losses for the long period so he has to close down his business.

6. No Advertisement/Research and Experiment

Small scale manufacturer cannot spend large sums of money on advertisement and experiment. Hence, he can neither introduce his product nor he can improve the quality of his product.

7. High Cost Per Unit of Output

In the small scale production fixed cost or overhead charges do not spread over large quantities that is why cost per unit is higher.

8. Credit Facilities from the Government

He cannot secure cheap credit because of unstable conditions of his business and lack of guarantee.

INTERNAL AND EXTERNAL ECONOMIES

When goods are produced at large scale a firm's average total cost starts decreasing i.e., it benefits from the economies. These economies can be grouped under two headings:

(A). Internal Economies

(B) External Economies

(A) INTERNAL ECONOMIES

"Internal economies are those economies in production which occur to the firm itself when it expands its output or enlarge its scale of production" (K.K. Dewitt). Internal economies are achieved through the ability and long experience of the entrepreneurs. They are attached to a specific business. Other entrepreneurs can not benefit from them. They internal economies arise from the use of modern technology i.e., new techniques of production which a firm in small scale either does not find it worth while to employ or it is impossible for the firm to adopt due to small financial resources.

Internal economies may be of the following types:

1. Administrative or Managerial Economies

When a firm expands its output OR enlarges the scale of production it follows the principle of division of labour and creates special departments e.g., marketing, production, cost, processing and administration etc. Specialists are employed e.g. sales manager, cost accountant, marketing manager etc., and as a result production process works smoothly. The entrepreneur gives attention to more important jobs e.g. import and export problems, credit from banks and concessions from the government etc. The administrative expenditures do not increase proportionally with the output and thus the firm benefits.

2. Technical Economies

Technical economies arise due to the large scale production because there is a mechanical advantage in the use of large machines. Technical economies may arise due to large size of the plant because it requires less energy, less staff, and proportionately and less cost of installing the plant. Specialised persons can only be employed with large machinery and plant. Thus, large scale producer benefits from specialists.

3. Marketing Economies/Commercial Economies

These economies arise from the purchase of raw material and sale of finished goods. When output of a firm increases, it purchases large quantity of raw material and gets preference by the firms they deal with e.g., freight concession, cheap credit and prompt delivery etc.

4. Indivisibility

We can get total benefit from most of the factors of production when they are being used at full capacity. If smaller output is being produced it means that they are not working according to their efficiency. This may be due to indivisibility.

5. Financial Economies

These may arise due to the reason that large scale firms have better credit facilities i.e., credit at cheaper rates, concession from the government for credit.

(B) EXTERNAL ECONOMIES

These economies are not related with the ability, skill, management, education and experience nor these are linked with a specific business. All the businesses enjoy these economies equally. These economies arise as a result of the expansion of the industry as a whole when industry expends machinery and raw material is available to all the firms at cheaper rates. New and better techniques of production are discovered. Better means of transportation and communication are available.

Trained labour and facility of workshop are also available. By product industries, helping industries and research centers are established. Entry of the new firms enables the firms to produce their output at lower cost. The external economies may be of the following types:

1. Transportation and Communication

Concentration of firms provide better communication system for all, the transport system reduce cost. Rail, road facilities become available to all, the transport system reduces cost.

2. Skilled Labour

With the concentration of firms skilled labour is available to all the firms because people living in the nearby areas get technical training.

3. Facility of Workshop

Concentration of firms provides incentive for the technical persons to establish their workshops and hence, all the firms benefits from these, because they need not to incure costs in establishing the workshops.

4. Helping Industry

This economy arise because of concentration of firms. In local industry it becomes possible to split up some of the processes which are taken over by specialist firms. For example in Faisalabad with the textile mills dying factories, designing centres, ginning factories and calendaring plants have been established.

5. Research and Experiment

In local industry, research and development are centralised each individual firm needs not to spend a separate amount on research and development. They benefit from common pool.

6. Banking Facility

The basic aim of the commercial bank is to earn maximum profits and for this they need deposits and provide credit to the traders, businessmen and industrialists etc. In a localised industry or business centres bank opens their branches and all the firms benefit from banking and credit facility. The banking system helps in promoting trade and business.

LAWS OF PRODUCTION/RETURNS/COSTS/OUTPUT

Production means production of goods & services. Production process is a combination of four factors of production. The factors of production are of two types. Some of the factors of production are variable e.g. labour and raw material while other factors of production are fixed (i.e., do not change in the short period) e.g. land, building, plant and machinery.

When the units of variable factors of production are employed on the fixed factors of production the marginal product (i.e., the product of every additional unit employed in a production process) and the average product (i.e., total product divided by the units of variable factor of production) may increase, remain constant or may be diminishing. If the M.P and A.P start increasing with the employment of variable factors of production, the production process is said to be operating under the law of increasing return/product or output. And if the M.P and A.P remains unchanged, the production process is said to be under the law of constant returns and if the M.P and A.P start diminishing with the employment of variable factors of production the production process is said to be operating under the law of diminishing return.

LAW OF INCREASING RETURNS

When the units of variable factor of production are applied on the fixed factor of production, the marginal product (M.P) and the average product (A.P) may be increasing, constant or decreasing. If with the continuous application of units of variable factors of production on the fixed factor of production in agriculture, extractive industry, minerals etc., marginal and average product starts increasing i.e., every next unit of variable factor of production gives more yield than the previous one, it is said that the production process is under the law of increasing returns or diminishing costs. The main reason of the application of increasing return is the **indivisibility of fixed factor of production** which is utilized effectively and as a result marginal and average product increases.

For example, there is a field of variable factor of production of 10 acres of land and only one unit of variable F.O.P has been applied. If 10 units are sufficient to get maximum output then with the increase in units of variable F.O.P Marginal and average product will increase. But if the field is divided into 10 equal holdings then marginal and average product will not increase.

The law can be explained with the help of schedule. Suppose that per unit cost of variable F.O.P is Rs. 100.

Note: $MC = \frac{\text{P.U cost}}{\text{MP}}$

and $AC = \frac{\text{P.U cost}}{\text{A.P}}$

Fixed Factor of Production	Units of Variable (FOP)	Total Product (TP)	Marginal Product (MP)	Average Product (AP)	Marginal Cost (MC)	Average Cost (AC)
10 acres	1 (Rs. 300/-)	10	10	10	30	30
"	2 "	30	20	15	15	20
"	3 "	60	30	20	10	15
"	4 "	100	40	25	7.5	12
"	5 "	150	50	30	6	10

It is clear from the table that the quantity of fixed factor of production is unchanged that is 10 Acres of land and the units of variable factor of production are increasing. Column No. 4 and 5 show that average product and marginal product are increasing with the increase in variable F.O.P. Column No. 6 and 7 show that marginal cost and average costs are decreasing with the increase in variable F.O.P that is why, law of increasing return is also called the law of decreasing cost. Law of increasing return or diminishing cost can be explained with the help of diagrams.

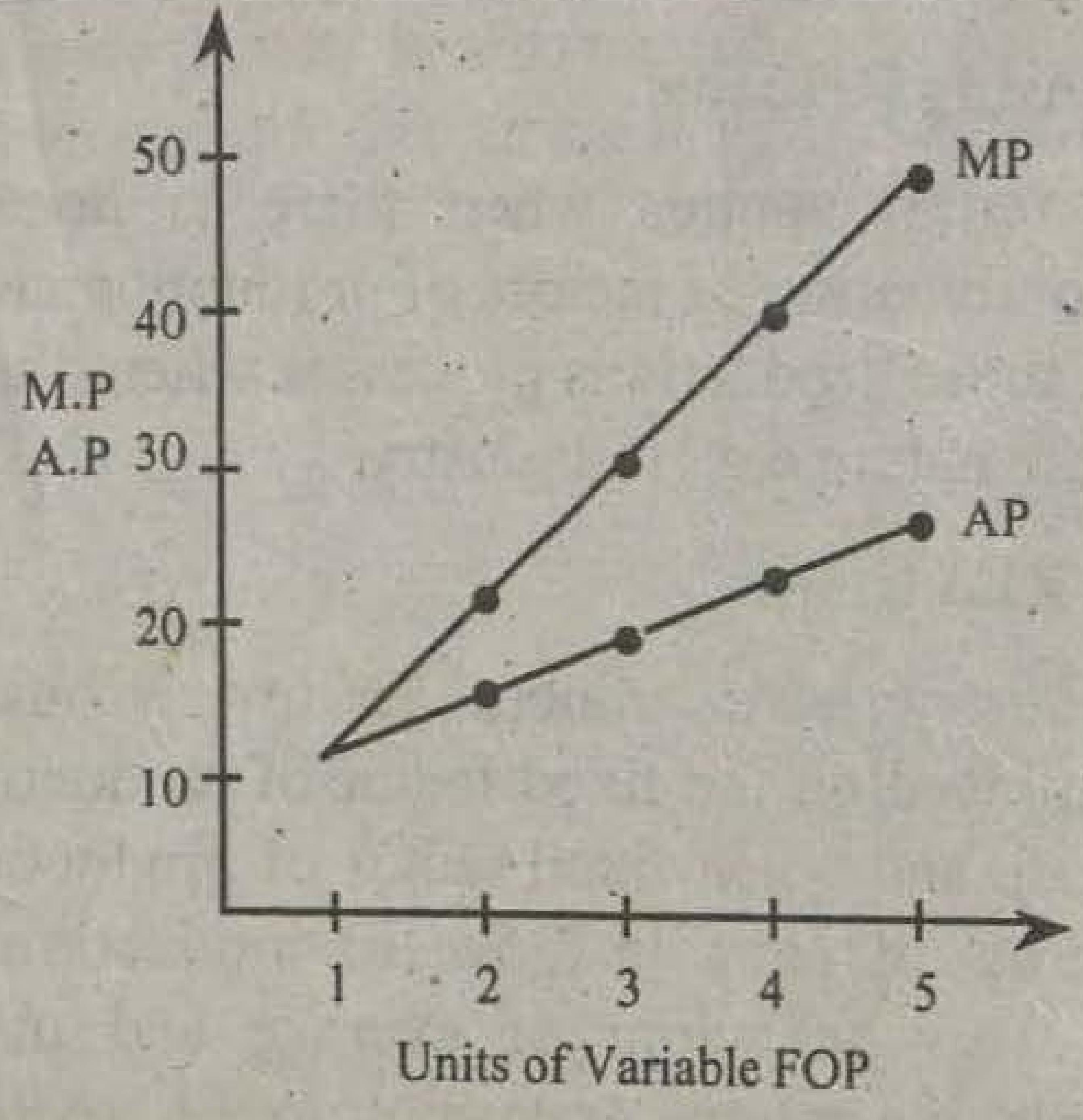


Fig. 1

Explanation Diagram No. 1:

Units of variable F.O.P. have been measured on x-axis and marginal product on y-axis. MP and AP are the marginal product average product curves which shows that M.P and A.P are increasing with the increase in variable F.O.P. (Positive slope shows direct relation).

Explanation Diagram No. 2:

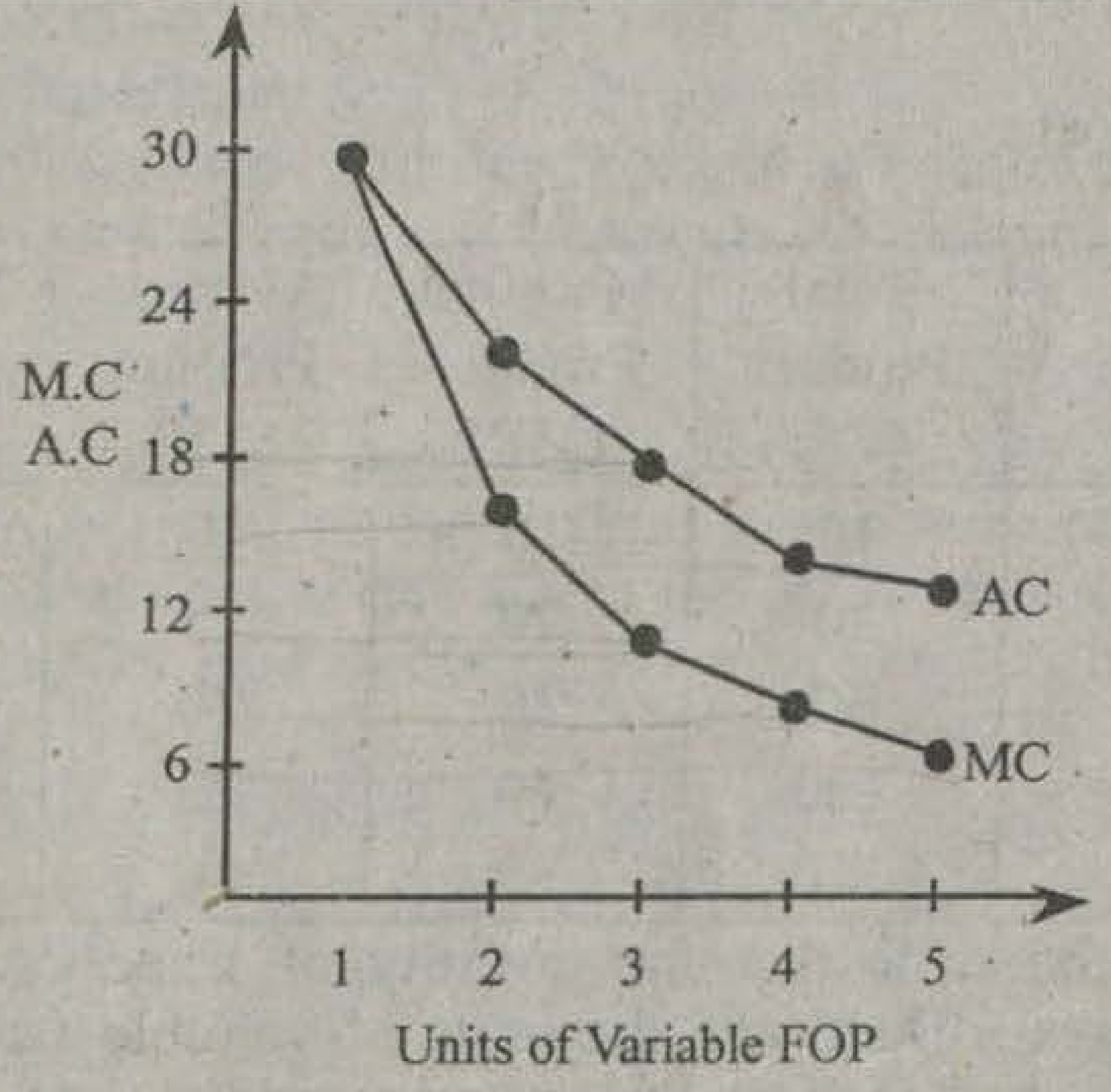


Fig. 2

Units of variable F.O.P. have been measured on x-axis and Marginal Cost and Average cost on y-axis. M.C and A.C are decreasing with the increase in units of variable F.O.P. (Negative slope of the curve shows inverse relation decreasing function).

Operation of Law of Increasing Returns

Law of increasing return applies when there is no shortage of factors of production there is a right combination of factors of production and the indivisible factors are being fully utilized or in those productions processes where the involvement of human factor is much greater than the nature e.g., in Industry.

LAW OF DIMINISHING RETURNS

If in agriculture, industry, trade, mineral, or in any business, units of variable factor of production are employed on the fixed factor of production initially, the average and marginal product increase and when fixed factor of production is fully utilized with the employment of more units of variable factor of production, average and marginal product start diminishing. This behaviour of average and marginal product in any business is called the diminishing return. According to Alfered Marshall an increase in capital and labour applied to the cultivation of land causes, in general, a less than

proportionate increase in the amount of the produce raised, unless it happens to coincide with the improvement in the art of agriculture" According to Richer A. Bilas". If the input of one resource is increased by equal increment per unit of time while the inputs of other resources are held constant, total product/output will increase, but beyond some points, the resulting output increase will become smaller and smaller".

The law of diminishing return can be explained with the help of a table:

Fixed Factor Land	Units of Variable F.O.P	Total Product (TP)	Average Product (AP)	Marginal Product (MP)	Marginal Cost (MC)	Averages (AC)
	(Rs.)					
10 acres	1 (300) per day	50	50	50	6	6
10	2 "	90	45	40	7.5	6.6
10	3 "	120	40	30	10	7.5
10	4 "	140	35	20	15	8.5
10	5 "	150	30	10	30	10

Note: Per unit cost of variable F.O.P. is Rs. 100 which is assumed to be constant:

(i) $AP = \frac{\text{Total product}}{\text{Units of variable FOP}}$

(ii) $MC = \frac{\text{Per unit cost}}{\text{Marginal product}}$

(iii) $AC = \frac{\text{P.U cost}}{\text{A.P}}$

It is clear from the table that an increase in units of variable F.O.P. average and marginal product is decreasing and marginal and average cost is increasing. As the cost per unit is unchanged and due to decrease in marginal product of every next unit is decreasing because of the application of diminishing return hence, marginal and average cost is increasing, that is why the law is also named as law of increasing cast.

The law can also be explained with the help of diagrams:

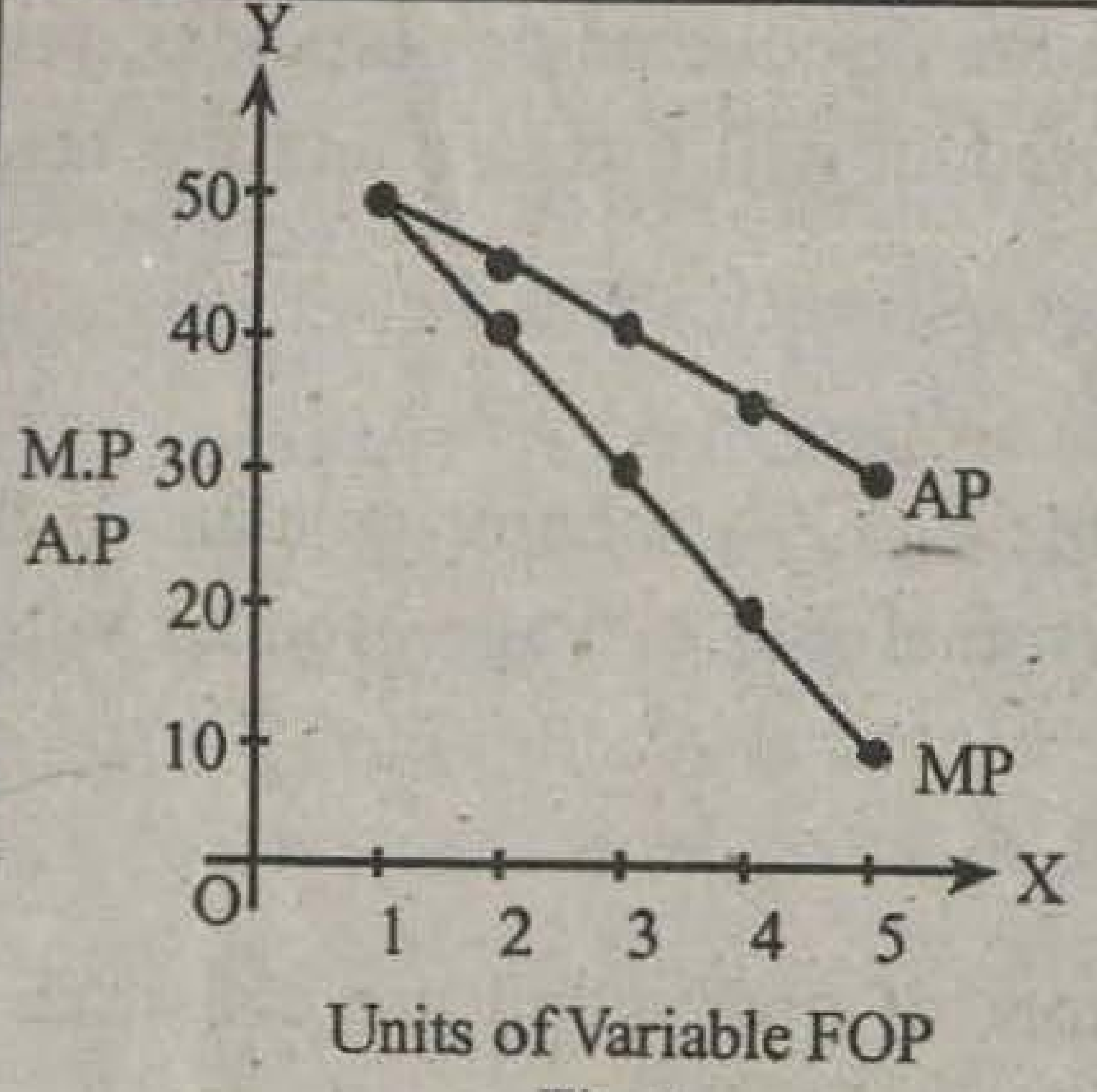


Fig. 1

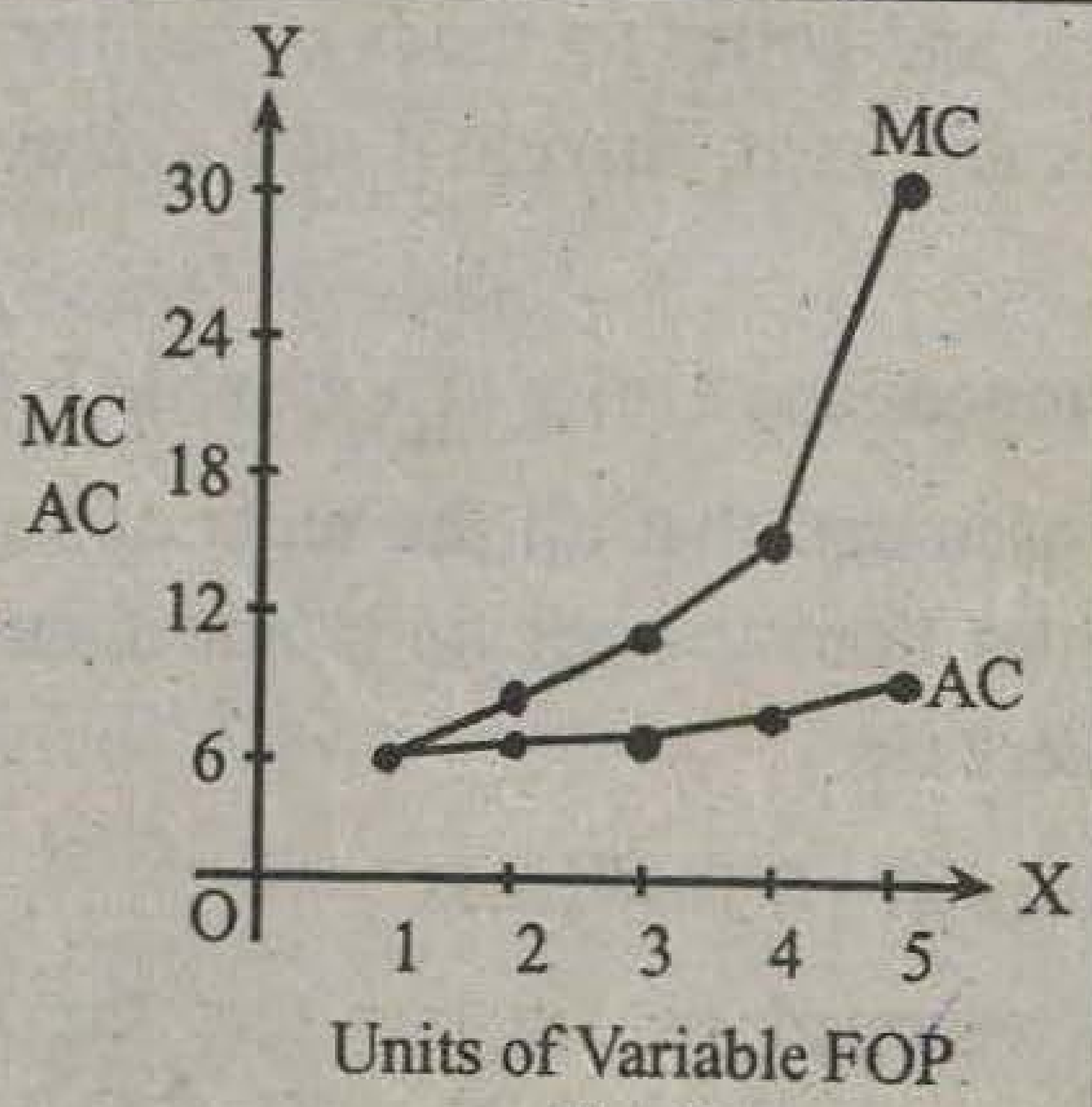


Fig. 2

Explanation Diagram No. 1:

Units of variable F.O.P. have been measured on x-axis and Marginal product and average product on y-axis. MP and AP curves show that with an increase in units of variable F.O.P. Marginal product and the average product starts decreasing.

Explanation Diagram No. 2:

Units of variable F.O.P. have been measured on x-axis and marginal cost and average cost on y-axis. The positive slope of marginal cost and average cost curves shows that with an increase in units of variable F.O.P. marginal cost and average cost start increasing.

ASSUMPTIONS

Law of diminishing returns is based on the following assumptions:

1. No Change in the Fixed F.O.P

The law is based on the assumption that the quantity of fixed F.O.P. does not change. If quantity of fixed F.O.P. increases the law will not hold because with the application of extra units of variable F.O.P. average and marginal products shall increase instead of decrease.

2. Law of Increasing Returns has Actually Ended

It is a necessary assumption for the law of diminishing return that law of increasing return has actually ended. Some times due to bad weather or unfavourable conditions the average and marginal product decrease, but when weather conditions become favourable and irrigation system is improved, marginal and average product again start increasing. It does not mean that law of increasing return has again applied, but actually law of increasing return had not completed yet.

3. No Change in Technology

If new and better methods of cultivation are discovered or pesticides, urea or best quality seeds are used, marginal and average product will increase and the law will not hold good.

4. Homogeneous Units of Variable F.O.P

It is assumed that all the units of variable F.O.P. are homogeneous. If the lateral units are better than the previous one then marginal and average product will increase instead of decrease.

5. Factors are Substitutes

It is assumed in the law that the factors of production are substitutes of one another i.e. we can substitute variable F.O.P. with fixed F.O.P.

APPLICATION OF LAW OF DIMINSHING RETURNS

The main reason of the application of diminishing return is the wrong combination of F.O.P. when units of variable F.O.P. are increased, the quantity of fixed F.O.P. remains the same, the variable F.O.P. cannot show its efficiency. The second reason is that factors are not perfect substitutes of one another.

IMPORTANCE

1. **Basis for the Malthusian Theory of Population**

According to Malthus, Population increases at a faster rate than the food production because law of diminishing return applies in agriculture.

2. **Basis for Recardian Theory of Rent**

According to Recardo Rent is paid because less fertile lands are cultivated as law of diminishing return applies in the more fertile lands.

3. **Optimum Size of Business**

The optimum size of the business is that when law of increasing return has completed and law of diminishing return has not yet started. With the help of this law we can determine this optimum level.

Why Law Operates More in Agriculture

The law of diminishing return applies more where nature's interference is greater than the human beings. In industry the interference by the nature is less and the entrepreneur with his ability can postpone the law of diminishing return for a longer period, but in agriculture the nature's interference is greater. In agriculture there is no better check because of vast area of agricultural land, so economies of large scale cannot be reaped in agriculture. Weather conditions play important role and if weather conditions are not favourable marginal and average product decrease. Another reason for the application of diminishing return is that the principle of division labour cannot be adopted.

The Law of Constant Returns or the Law of Constant Costs

Other things remaining the same when the additional units of variable factors of production are applied on the fixed factor of production, there arises a proportionate increase in total output is called the law of constant returns.

It applies to those industries which represent a combination of manufacturing as well as extractive industries in manufacturing industries, additional investment of labour and capital (variable FOP) may result in more than proportionate increase in the amount of goods produced. While in extractive industries an increase in investment is variable factors of production may result in less than proportionate increase in the amount of goods produced. If the increased marginal productivity is balanced with the diminishing productivity in the other industries, we may state that the law of constant return is applying.

Conditions of the Law

(i) No increase in the prices of raw material in the industry.

(ii) No change in the price of factors of production.

(iii) The supply of factors of production is perfectly elastic.

(iv) Indivisibility of fixed FOP and productive services are not fixed.

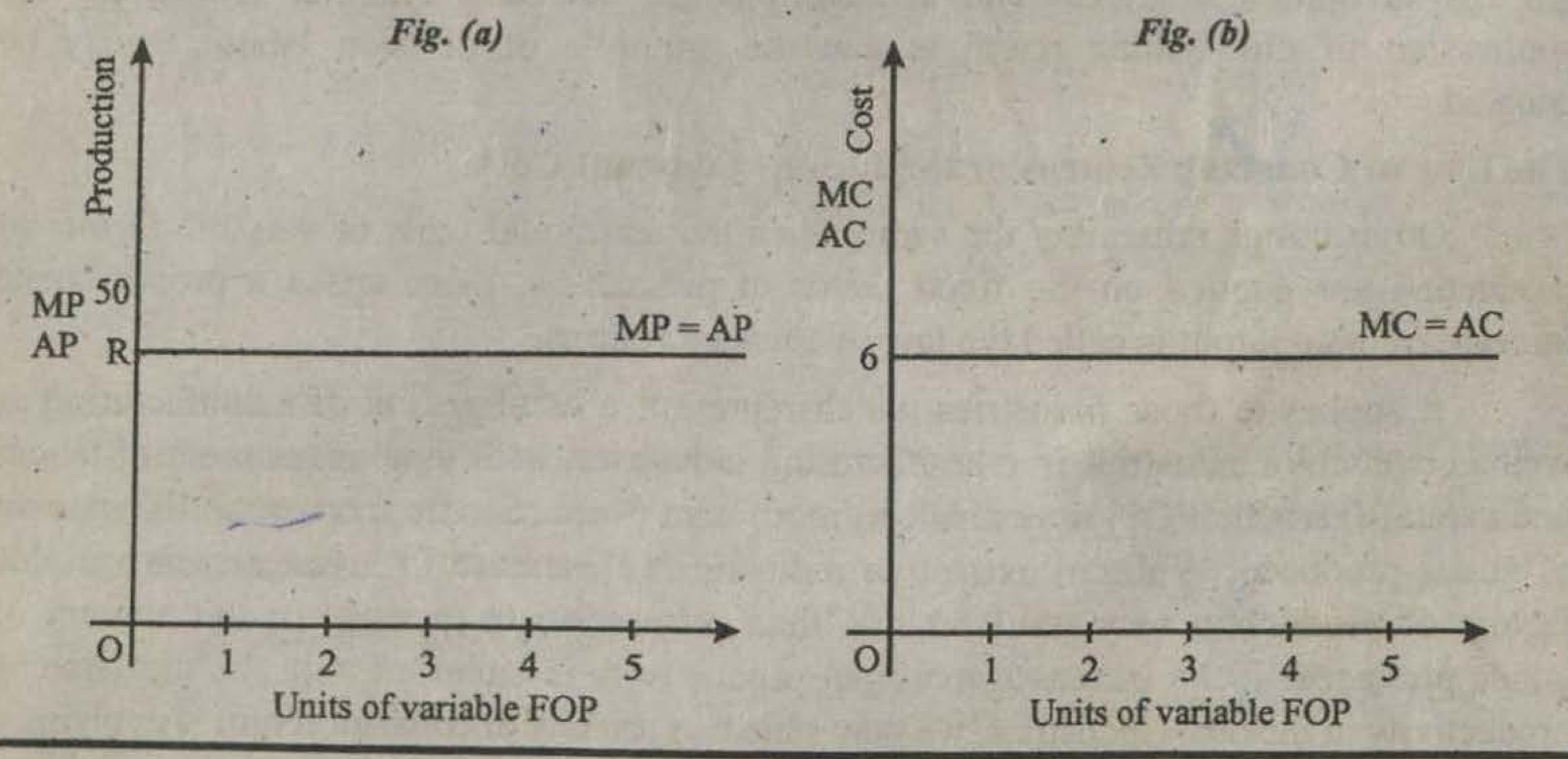
The law of constant returns can be explained with the help of a schedule.

Fixed POP Land	Variable FOP (Units) Labour (Rs. 300 per day)	Marginal Physical Product (MP)	Total Physical Product (TP)	Average Physical Product (AP)	Marginal Cost (MC)	Average Cost (AC)
25 acres	1	50	50	50	6	6
"	2	50	100	50	6	6
"	3	50	150	50	6	6
"	4	50	200	50	6	6
"	5	50	250	50	6	6

In the above schedule it is shown that the proportion of marginal physical product and average physical product remains the same. On the other side proportion of marginal cost is also equal to the proportion of average cost.

Note: $MC = \frac{P.U.\ Cost}{M.P}$ and $AC = \frac{P.U.\ Cost}{A.P}$

The law can be explained with the help of a diagrams.



LAW OF VARIABLE PROPORTIONS

Law of variable proportions explain that with a given technology when units of variable factor of production are employed on the fixed factor of production, marginal and average product increases in the beginning but when the fixed factor of production is utilized fully or utilized more units of variable factor of production gives less and less marginal and average product. According to Benheam. "As the proportion of one factor in a combination of factors is increased, after a point, first the marginal and then the average product of that factor will diminish". According to P.A. Samuelson" an increase in some inputs relative to other comparatively fixed inputs will cause the output to increase but after a point the extra addition resulting from the same addition of input will decrease the income".

ASSUMPTIONS

The law of variable proportion is based on the following assumptions:

1. **No Scientific Improvement**

   It is assumed that the state of technical knowledge is given and remains unchanged, otherwise the marginal and average product will be increasing instead of decreasing.

2. **Fixed Factor of Production does not Change**

   The law holds only when fixed factor of production does not change i.e., only one factor is variable, other factors being held constant.

3. **Substitution of Factors of Production**

   It is assumed that factors are substitutes of one another. It is possible to vary the proportions in which various inputs become variable.

4. **Homogeneous Units**

   All units of variable factor of production are homogeneous. i.e., all the workers are equal in physical health and mental capabilities.

5. **For the Short period Only**

   It assumes that the period is short run, because in the long run all inputs become variable.

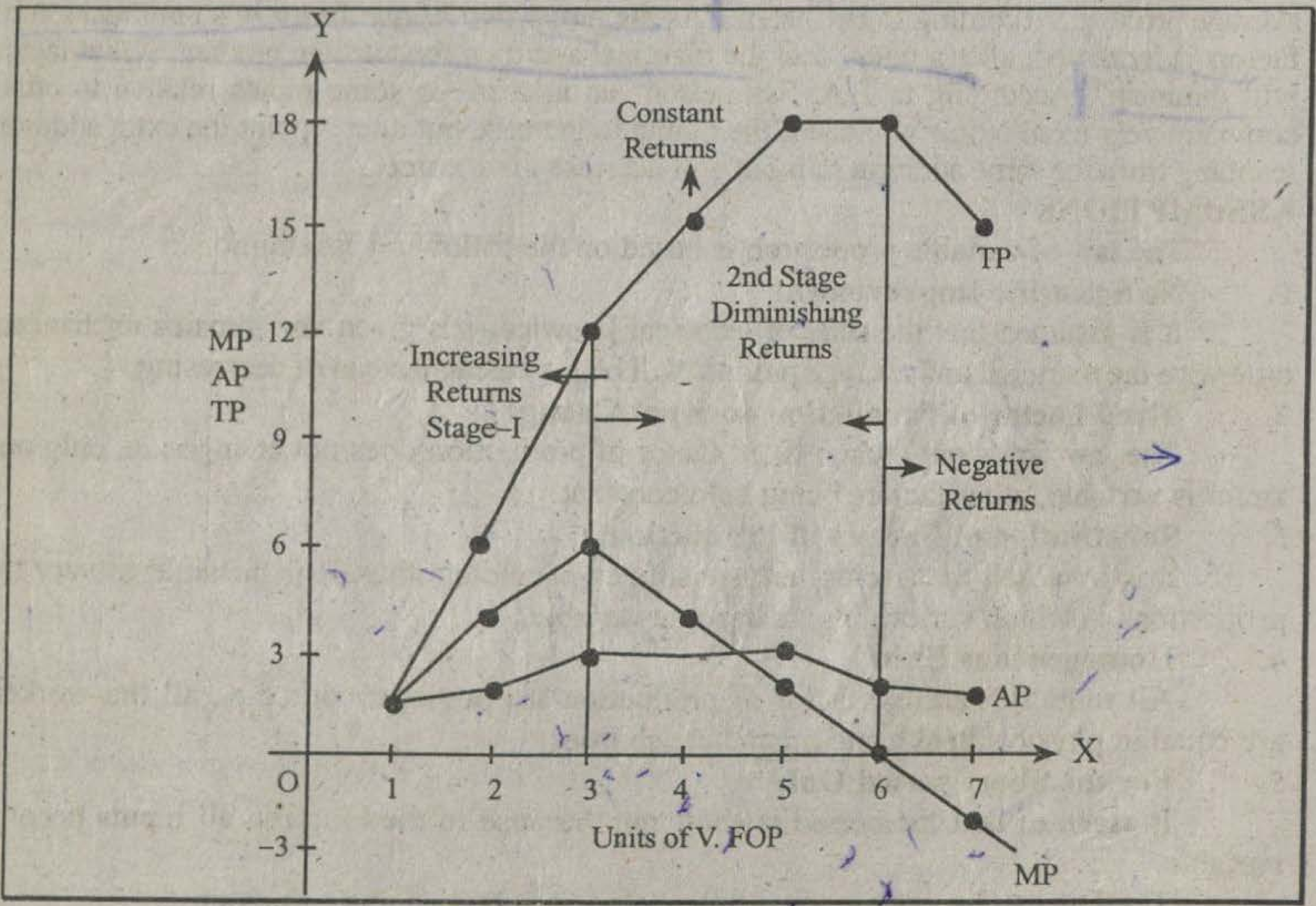
The law can be explained with the help of a schedule and a diagram:

SCHEDULE

Suppose that fixed factor of production is 10 acres of land.

Units of Variable Factor of Production	Total Product (Quintals) (TP)	Marginal Product (Quintals) (MP)	Average Product (Quintals) (AP)	
1	2	2	2	State-I increasing returns
2	6	4	3	
3	12	6	4	
4	16	4	4	Stage-II diminishing returns
5	18	2	3.6	
6	18	0	3	
7	16	–2	2.3	State-III negative returns

It is clear from the table that uptill 3rd unit of variable F.O.P. marginal and average product is increasing it is the stage 1, that represents increasing return. From 4th to 5th unit, the average product is decreasing (represents diminishing return) it is the second stage. With the employment of 7th unit of variable F.O.P the marginal product is negative it is 3rd stage i.e., of negative return.



In the diagram units of variable F.O.P have been measured on x-axis and marginal, average and total product on y-axis. Uptill 3rd units marginal and average product are increasing. At 4th unit marginal product curve and average product curve intersect each other i.e., marginal product is equal to average product (where two lines either intersect or tangent at the point of intersection of tangency they are equal). At 7th unit marginal product is negative as M.P. curve is in the 4th quadrant. From 1st unit to 3rd unit marginal product and average product are increasing. It is first stage which represents increasing return. This stage is not so important for the firm because there is an incentive for the firm to employ more units of variable F.O.P., from 4th to 5th unit average product and marginal product are diminishing, it is the 2nd stage. It represents diminishing return. This stage is the most important for the firm. In this stage efficiency of variable F.O.P. is decreasing while the efficiency of fixed F.O.P. is still there because total product is still increasing. At 6th unit marginal product is zero and this stage is of least importance for the firm because none of the firm can bear losses. So the firm is not concerned with this stage. In this stage marginal product is negative and total product is also decreasing. This stage shows that both the variable and fixed factors of production are not being used efficiently.

IMPORTANCE:

The second stage is known as the variable proportions or non-variable proportions. Law of variable proportions shows the efficiency of factors of production in the production process. It also shows the technique of production.

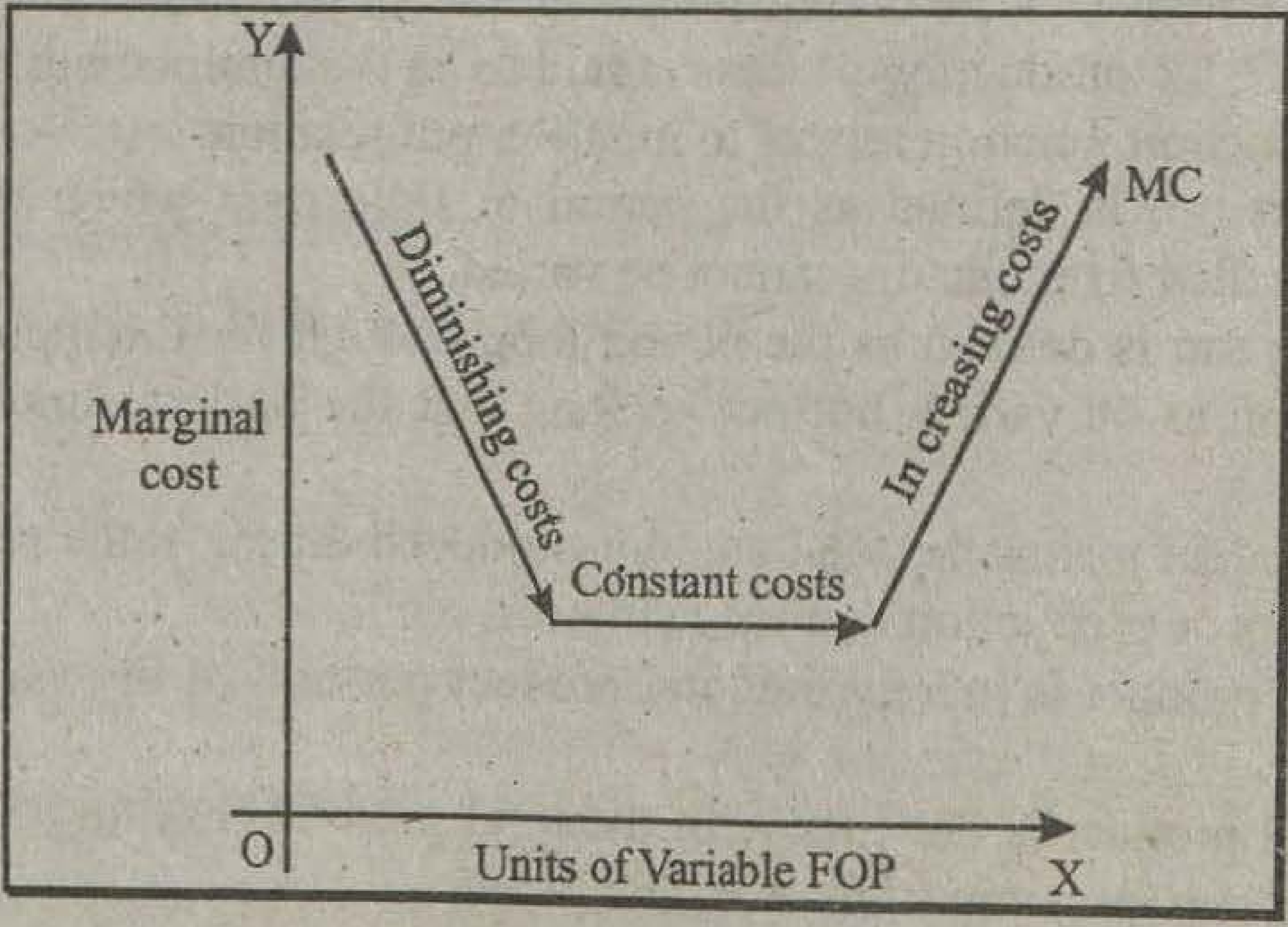
The Law of Costs/The Law of Returns:

The laws of return can also be expressed in terms of law of costs. We have studies that marginal cost is diminishing during the operation of law of increasing return, marginal costs remain the same during the operation of law of constant costs and the marginal costs start increasing during the operation of the operation of the law of diminishing return.

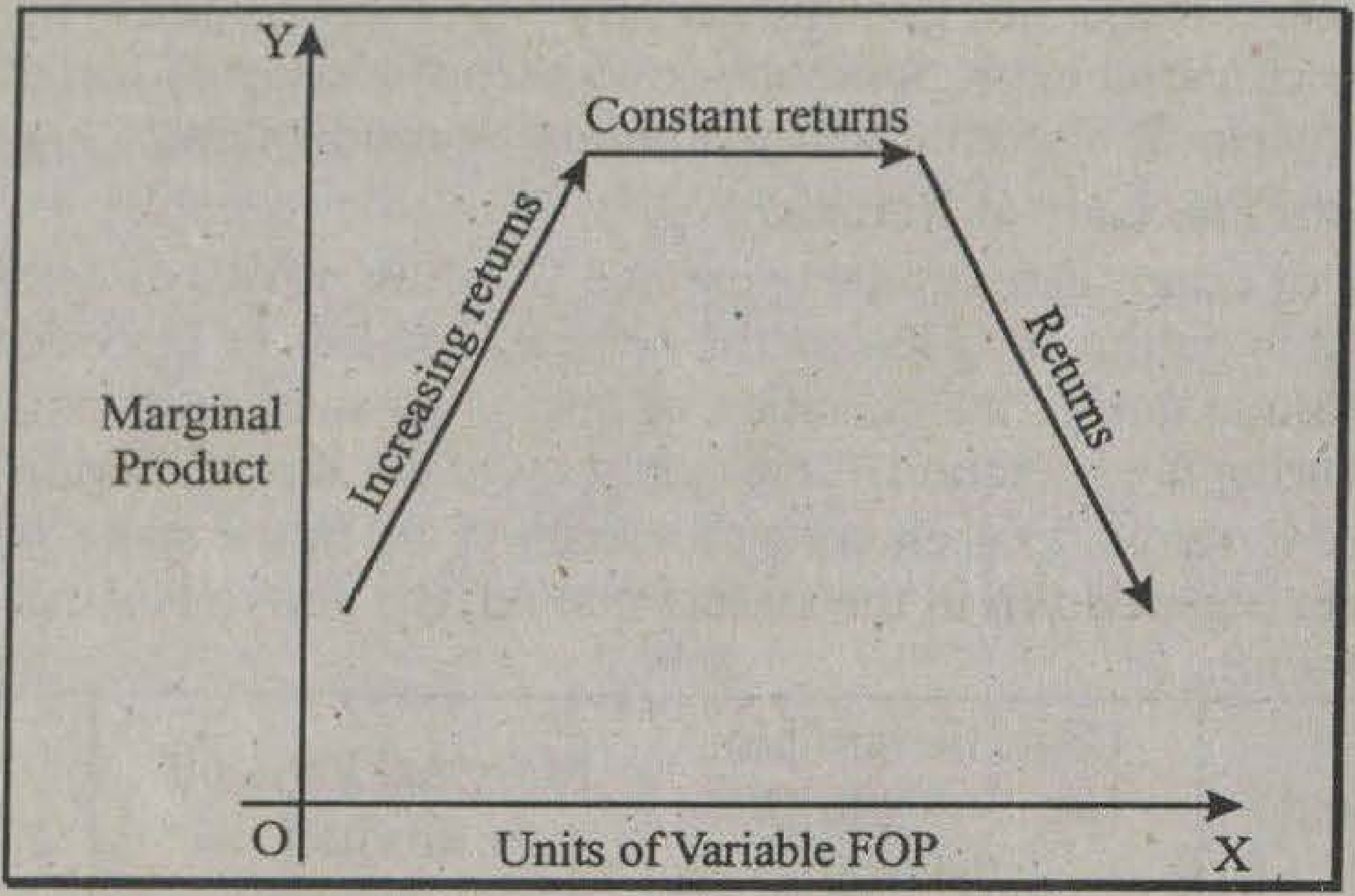
If the cost incurred on each units of variable FOP is the same say Rs. 100/= P. day because of perfect competition in the factors market, the above law can be explained with the help of a schedule.

Fixed FOP Land	Units of variable (Rs. 300/=) FOP (Labour)	Marginal Physical Product	Marginal Costs
25	1	10	30
25	2	20	15 diminishing
25	3	30 Stage-I	10 costs
25	4	30	10 constant costs
25	5	Stage-II 30	10
25	6	20	15 increasing
25	7	10 Stage-III	30 costs

The law expresses the experience of the production process. Initially it is operating under the law increasing return or diminishing costs, then it is operating under the law of constant returns and constant costs and finally it is operating under the law of diminishing return or increasing costs. The law of costs can be explained with the help of a diagram.



The law of returns to scale can also be explained with the help of a diagram.



CHAPTER ROUNDUP

1. Firm is a decision making unit with an objective of maximum profits. The firm can increase its profits either by selling price, diminishing cost of production or decreasing selling price.
2. The basic problems of a firm are:
   (a) Choice of industry
   (b) Choice of place
   (c) Choice of scale of production.
   (d) Decision of output
   (e) Factors combination
3. Internal economies are those economies in production which accur to the firm it self when it expends its output or enlarge its scale of production.
4. External economies arise as a result of the expansion of the industry as a whole.
5. When MP and AP start increasing with the employment variable FOP, the production process is said to be under increasing return.
6. When MP and AP start diminishing with the employment of variable FOP on the fixed FOP, the production process is said to be the diminishing return.
7. The production function relates to input-output relation.
8. The short run is defined as the period of time over which the inputs of some factors, called fixed factors cannot be varied.
9. The long run is defined as the period long enough for the inputs of all factors of production to be varied, but not so long that the basic technology of production changes.
10. Total product means the total amount produced during some period of time by all the factors of production that the firm uses.
11. Average product is merely the total product per unit of the variable factor, which is labour.
12. Marginal product is the change in the total product resulting from the use of one more (or one less) unit of the variable factor.

SHORT QUESTION ANSWER

Q.1 What is a firm and how can a firm maximize its profits?

Ans. What is a Firm: A firm is a decision making unit, which has the power to make decision within the areas under its control, i.e., a person or group of persons who start business, manage it and take responsibilities. The basic aim of the firm is to maximize profits in three ways:

(i) By Increasing the Selling Price

(ii) By Decreasing Cost of Production

(iii) By Decreasing Selling Price

Q.2 What are the basic problems faced by a firm?

Ans. Basic Problems of a Firm:

1. Choice of Industry
2. Choice of Place
3. Choice of Scale of Production
4. Decision of Output
5. Factors Combination

Q.3 Define "scale of production".

Ans. Scale of Production: By scale of production we mean, what should be the level of production i.e., what quantity of output should be produced. The quantity of output influences the profit, if its profits are maximized at small scale of production the firm shall produce on small scale of production otherwise firm will produce at large scale.

Q.4 What are the determinants of scale of production?

Ans. Determinants of Scale of Production:

1. Financial Resources
2. Ability of Entrepreneur
3. Technical Possibilities
4. Nature of Work
5. Extent of Market
6. Means of Transportation and Communication

Q.5 Define and differentiate internal economies and external economies.

Ans. **Internal Economies:** "Internal economies are those economies in production which occur to the firm itself when it expands its output or enlarge its scale of production" (K.K. Dewitt). Internal economies are achieved through the ability and long experience of the entrepreneurs. They are attached to a specific business. Other entrepreneurs can not benefit from them.

External Economies: These economies are not related with the ability, skill, management, education and experience nor these are linked with a specific business. All the businesses enjoy these economies equally. These economies arise as a result of the expansion of the industry as a whole when industry expands machinery and raw material is available to all the firms at cheaper rates. New and better techniques of production are discovered. Better means of transportation and communication are available.

Q.6 Write short note on short period and long period.

Ans. **The Short Run:** The short run is defined as the period of time over which the inputs of some factors, called fixed factors cannot be varied.

The Long Run: The long run is defined as the period long enough for the inputs of all factors of production to be varied, but not so long that the basic technology of production changes.

EXERCISE

Q.1 What is firm? What are the problems of firm and how they are solved.

Q.2 What is scale of production? What are the determinants of scale of production?

Q.3 Explain the advantages and disadvantages of large scale production or Merits and demerits of large scale of production, or Economies and dis-economies of large scale production.

Q.4 Explain the advantages (merits) and disadvantages (demerits) of small scale production.

OR

Economies and diseconomies of small scale production?

Q.5 Write a comprehensive note on Internal and External economies.

OR

Distinguish between Internal and External economies. How do they arise?

Q.6 Explain and discuss the law of increasing returns. Why it is called the law of diminishing cost and why it is specially applicable to manufacturing industries?

Q.7 Explain the law of diminishing returns with the help of table and diagram. Why it is called law of increasing cost, why the law operates mainly in agriculture.

OR

Explain the law of diminishing returns. Does apply to agriculture only. What is the importance of the law?

Q.8 Explain the law of variable proportions or unvariable proportions with the help of a schedule and a diagram?

Q.9 Explain the law of constant returns or constant costs.

Q.10 Describe in brief the law of costs or the law of constant returns.

✿ ⑤ ✿

1 2 3 4 5

90

CHAPTER 6

FIRM'S PRODUCT, COSTS AND REVENUE

TOTAL PRODUCT

Total product of a firm is equal to the total goods produced by a specific quantity of factors of production e.g. if a cement factory is producing 10,000 bags of cement per *month* it is its total product for the month or total product is the addition of marginal products.

MARGINAL PRODUCT

It is the addition made to the total product by employing one more unit, next unit or last unit of variable factor of production on the fixed factor of production or it is the rate of change in total productions.

AVERAGE PRODUCT

The total output from using a set of inputs divided by the amount of anyone of inputs used e.g., the average product of labour being used. It may be written as:

$$\text{Average Product (Labour)} = \frac{\text{Total Product}}{\text{Units of variable F.O.P (Labour)}}$$

RELATIONSHIP BETWEEN MARGINAL PRODUCT & TOTAL PRODUCT

As the total product is addition of marginal products therefore, as MP is increasing, TP will increase and when MP = 0, TP should be maximum and when MP becomes negative, TP starts decreasing.

Marginal Product and Average Product

AP is derived by dividing the TP to units of variable FOP and TP is the addition of the MP therefore, the behaviour of MP and the AP will be the same however the increasing and diminishing rate of marginal is always faster than the average i.e., average increases or decreases at a slow rate while marginal's of change is always faster.

The relationship between marginal product and total product, marginal product and average product can be explained with the help of a schedule:

Units of Variable F.O.P.	Total Product (T.P) Qtls	Marginal Product (M.P) Qtls	Average Product (A.P) Qtls
1	5	5	5
2	15	10	7.5
3	30	15	10
4	40	10	10
5	45	5	9
6	45	0	7.5
7	40	–5	5.7

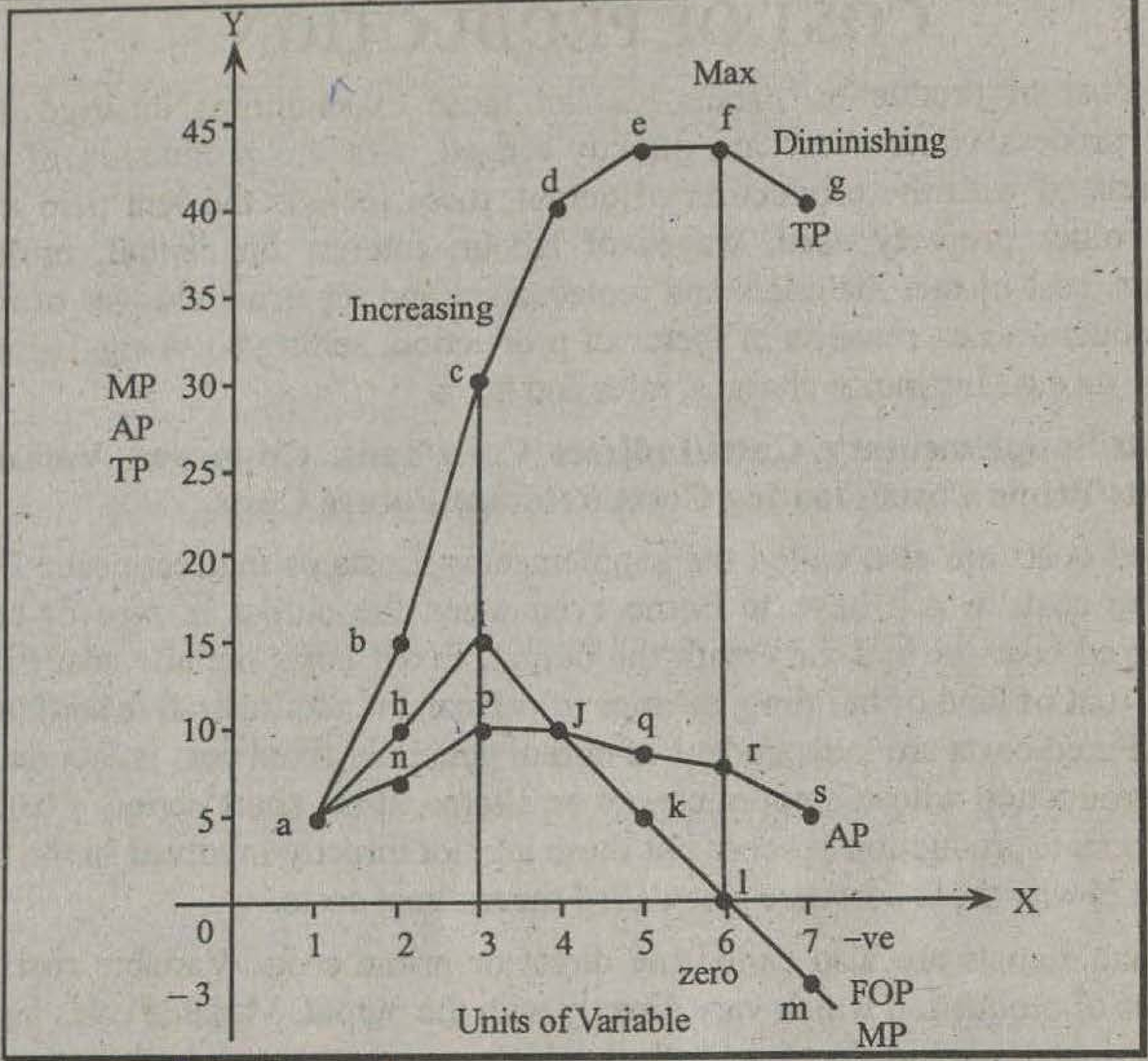
Relationship between Marginal Product and Total Product

1. When marginal product is positive, total product is increasing. In the table marginal product is positive upto 5th unit and total product is increasing from 5 to 45.
2. When Marginal Product is zero, total product is maximum. In the table marginal product is zero at 6th unit and total product is maximum i.e., 45.
3. When marginal product is negative, total product starts decreasing. In the table marginal product is negative at 7th unit and total product has fallen from 45 to 40.
4. Total product is the addition of the marginal products.
5. Marginal product is the change in the total product.

Relationship between Marginal Product and Average Product

1. When average product is increasing, marginal product is also increasing. In the table average product is increasing upto 3rd unit i.e., from 5 to 10 and marginal product is increasing from 5 to 15 but average product is increasing at a slower rate while marginal product is increasing at a faster rate as evident from the gap.
2. When average product is maximum, marginal product is equal to average product. In the table average product is maximum at 4th unit i.e., 10 and marginal product is also 10.
3. When average product is decreasing, marginal product is also decreasing. In the table from 5th unit to 7th unit average product is decreasing and marginal product has also decreased from 5 to –5, but average product is decreasing at a slower rate while marginal product is decreasing at faster rate.

The relationship between marginal product and total product, marginal product and average product can be explained with the help of a diagram.



Units of variable FOP have been measured on x-axis and total product, marginal product and average product on y-axis. TP is the total product curve which has been drawn by joining the points a, b, c, d, e, f and g. MP is the marginal product curve which has been drawn by joining the points a, h, i, j, k, l and m. AP is the average product curve which has been drawn by joining the points a, n, p, j, q, r and s.

It is clear from the diagram that marginal product is positive uptil 5th unit and total product is increasing from a to e. At the 6th unit marginal product is zero and total product is maximum as shown by point f. After 6th unit marginal product is negative and total product has fallen from f to g.

From 1st unit to 3rd unit average product is increasing i.e., from a to p and marginal product is also increasing from a to I. The marginal product curve is above the average product curve which shows that average product increases at a slower rate while marginal product increases at a faster rate. At 4th unit marginal product curve MP and average product curve AP intersect each other at point j. That is at J both are equal. (It is a rule of mathematics that when two curves or lines intersect each other or tangent to one another at that point of intersection or tangency both are equal). At point J average product is maximum i.e., 10 and marginal product is also 10. From 5th unit to 7th unit average product is decreasing and marginal product is also decreasing. The average product curve is above the marginal product curve which shows that average product decreases at a slower rate while marginal product decreases at a faster rate.

COST OF PRODUCTION

By cost of production means that all those expenditures incurred during the production process either these are directly related with the production of output, or indirectly related with the production of output, these include the rent paid to the land owners or other property used, wages of labour, interest on capital, profits of the entrepreneur, cost of raw materials and replacement and repairing charges of machinery. Cost of production i.e., rewards of factor of production, selling costs e.g., advertisement and other costs e.g., insurance charges, rates and taxes.

Fixed Costs/Supplementary Costs/Indirect Costs/Sunk Costs and Variable Costs Direct/Costs/Prime Costs/Floating Costs/Relevant Future Costs

Fixed costs are also called the supplementary costs or indirect costs. Fixed costs are all those costs which have to borne even when the output is zero or temporarily stopped. Fixed costs do not vary with the output. Fixed costs include cost of plant and machinery, rent of land or building, salaries of permanent administrative staff and interest on capital. Fixed costs are independent of output generally fixed cost is incurred in hiring factors of production whose amount cannot be altered in the short period. Fixed costs are necessary to start production process but these are not directly involved in the production process that is why these costs are also called the indirect costs.

Variable costs are also called the direct or prime costs. Variable costs are those expenditures of production which vary directly with the output. Variable costs increase with the increase in output and decrease with the decrease in output and when output is zero, variable costs are e.g., cost of raw materials (primary and finished), electricity expenses, gas charges, water telephone expenses and transport expenses. If output increases these expenditures increase and with a decrease in output these expenditures decrease.

The difference in fixed costs and variable cost is only in the short period because fixed costs become variable costs in the long period.

Short Period and Long Period Costs

Short period is a period with in which the firm cannot vary fixed factor of production such as plant and machinery, rent of land and building, salaries of permanent staff, overhead charges and interest or capital. In the short period a firm can only vary the variable factors of production such as raw materials, water, telephone and transport expenses. The costs incurred on variable factors of production in the short run called the short run costs. Long period is a period within which the firm can vary not only the variable factor of production but also the fixed factor of production. If profit increase in the short period the firm can increase production only by hiring services of more labour and buying more raw materials but it cannot alter the size of plant, and machinery or it can build a new plant. In the long run a firm can increase or decrease the amount of variable as well as fixed factor of production. The costs incurred on the variable as well as on the fixed factor of production are called the long run costs.

Total Costs

The total expenditures incurred in producing a specific quantity of output are called the total costs or total cost is equal to total fixed costs plus total variable costs or given the fixed costs of firm total cost is the addition of marginal cost or total cost is equal to average total cost multiplied by units of output produced. (In the short period only derived).

Average Total Costs (ATC)

It is the cost per unit of output, it may be derived as ATC = TC/Q where Q is the output and TC is the total cost or average total cost is equal to the addition of average fixed costs average and the variable costs.

i.e., $\quad ATC = AFC + AVC$

Where AFC is average fixed cost and AVC is average variable cost.

Average Variable Cost (AVC)

It is the variable cost per unit of output. It may be derived as AVC = VC/Q where Q is output and VC is the variable cost. OR average variable cost = average total cost (–) average fixed cost.

i.e., $\quad AVC = ATC - AFC$

Average Fixed Cost (AFC)

It is the fixed cost per unit of output. It may be derived as AFC = FC/Q. Where Q is the output and FC is the fixed cost. OR average fixed cost = average total cost – average variable cost because fixed cost = total cost (–) variable cost.

i.e., $\quad AFC = ATC - AVC$

Marginal Cost (MC)

The cost incurred in producing one more unit, next unit or the last unit is called the marginal cost. It is the addition made to the total variable cost by the employment of one more unit of variable factor of production. (Fixed cost remaining the same).

Fixed Costs (FC)

It is the portion of the total cost which does not vary with the output such as cost of machinery and plant, rent of land and building, interest on capital etc. It is also called the indirect or supplementary cost.

Variable Costs (VC)

It is the portion of total costs which varies directly with the output. If output is maximum, variable cost is maximum and when output is zero variable cost is zero. It is also called direct cost or prime cost.

The concept of total costs, average total costs, average fixed costs average variable costs and marginal costs can be explained with the help of a schedule and diagram. Fixed cost of the firm is 100.

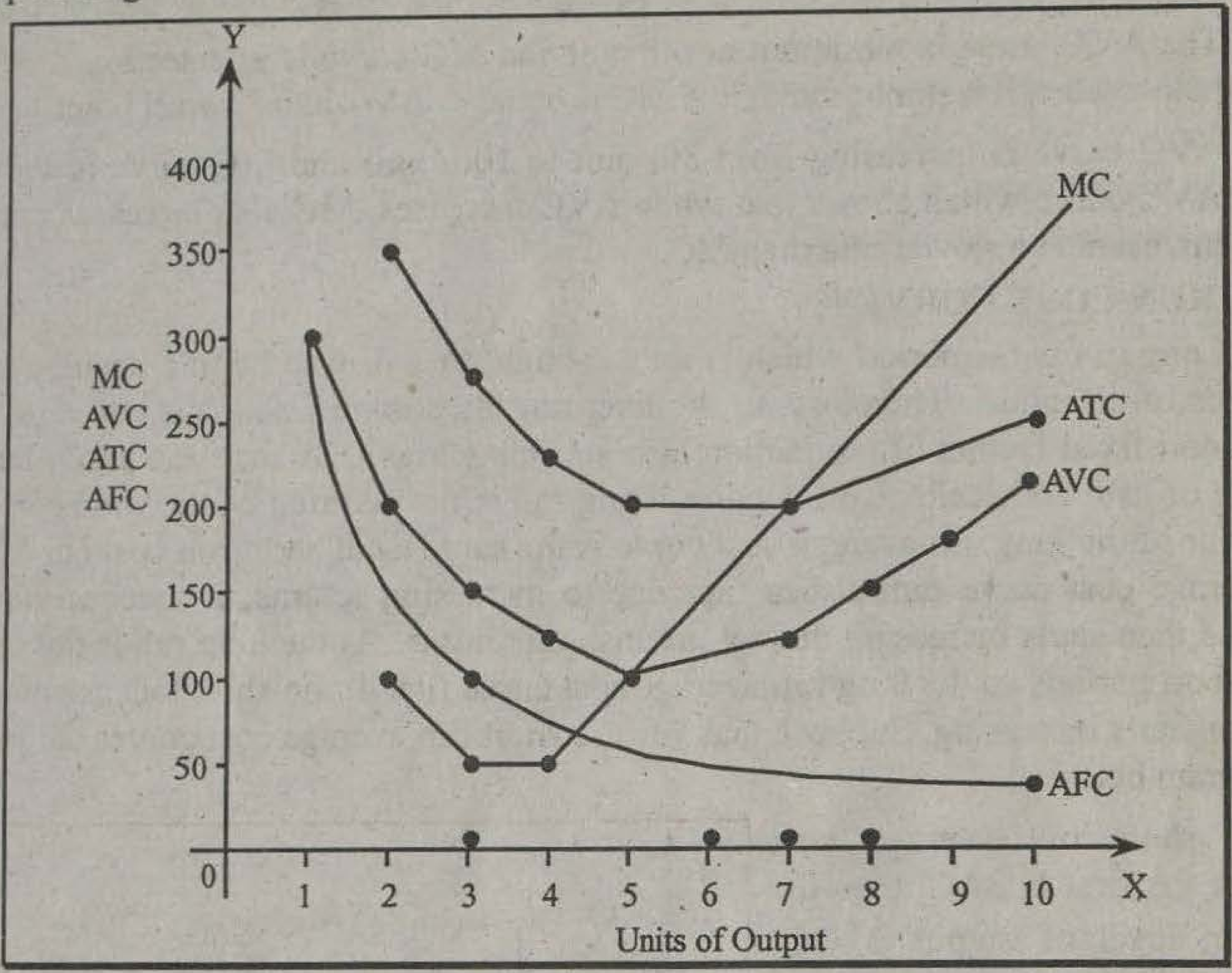
I Units of Output Q	II TFC	III TVC	TC IV = II + III	V V = II ÷ I AFC	VI III ÷ I=VI AVC	VII IV–I=VII ATC or (V + VI)	$\frac{dTC}{d\theta}$ or $\frac{dVc}{d\theta}$ VIII MC
1	300	300	600	300	300	600	300
2	300	400	700	150	200	350	100
3	300	450	750	100	I 150	250 I	I 50
4	300	500	800	75	125	200	50
5	300	600	900	60	120	180	100 I
6	300	720	1020	50	II 120	170	II 120
7	300	890	1190	43	127	170 II	170 II
8	300	1100	1400	37.5	137.5	175	210
9	300	1350	1650	33	III 150	183.3 III	III 250 III
10	300	1700	2000	30	170	200	350

It is clear from the above schedule that the fixed cost is unchanged through out i.e., 300 but AFC is decreasing because when output increases, the fixed costs spread over the total output and hence, AFC is decreasing due to law of increasing returns.

Relationship between MC. ATC and AVC

1. It is clear from the table that from 1st unit to 6th unit average total cost (ATC) is diminishing and marginal cost is less than average total costs. Marginal cost at 7th unit is equal to average total costs and average total costs are minimum.
2. Average total cost is increasing from 8th unit to 10th unit and marginal cost is also increasing but average total cost is increasing at a slower rate than the marginal cost.
3. Average variable cost is diminishing from 1st unit to 5th unit
4. Average variable cost is diminishing at 5th unit and marginal cost is equal to AVC. When AVC is minimum. i.e., at 6th unit of output.
5. Average variable cost is increasing from 7th to 10th unit and marginal cost is also increasing but marginal cost is increasing at a faster rate than the AVC.

The behaviour and inter-relationship between cost curves can be explained with the help of diagram.



Explanation:

In the diagram units of output have been measured on x-axis and marginal cost, average variable cost and average total cost and AFC have been measured on y-axis. ATC is average total cost curve. It is decreasing uptil 7th unit it touches minimum value at 7th unit and then starts increasing. AVC is the average variable cost curve. It is decreasing uptil 5th unit and it is minimum at 6th unit and then starts increasing, average variable cost curve (AVC) remains below the ATC and the difference between ATC, AVC and AFC is diminishing because FC spreads with the increase in output but AFC is never zero as FC in the short period is never zero i.e., why both the curves will not intersect. MC curve is above the ATC and AVC when both are increasing and remains below when ATC and AVC are falling: We can conclude from the above.

1. When ATC is falling, MC is also falling and MC is less than ATC that is why MC curve remains below the ATC.
2. At a minimum point of ATC curve, MC curve intersects ATC curve from below that is when ATC is minimum MC is equal to ATC.
3. A.T.C. curve is increasing from 8th to 10th unit and MC curve is above the ATC curve, which shows that ATC curve increases at a slower rate than the MC curve that is why MC curve is above the ATC curve.

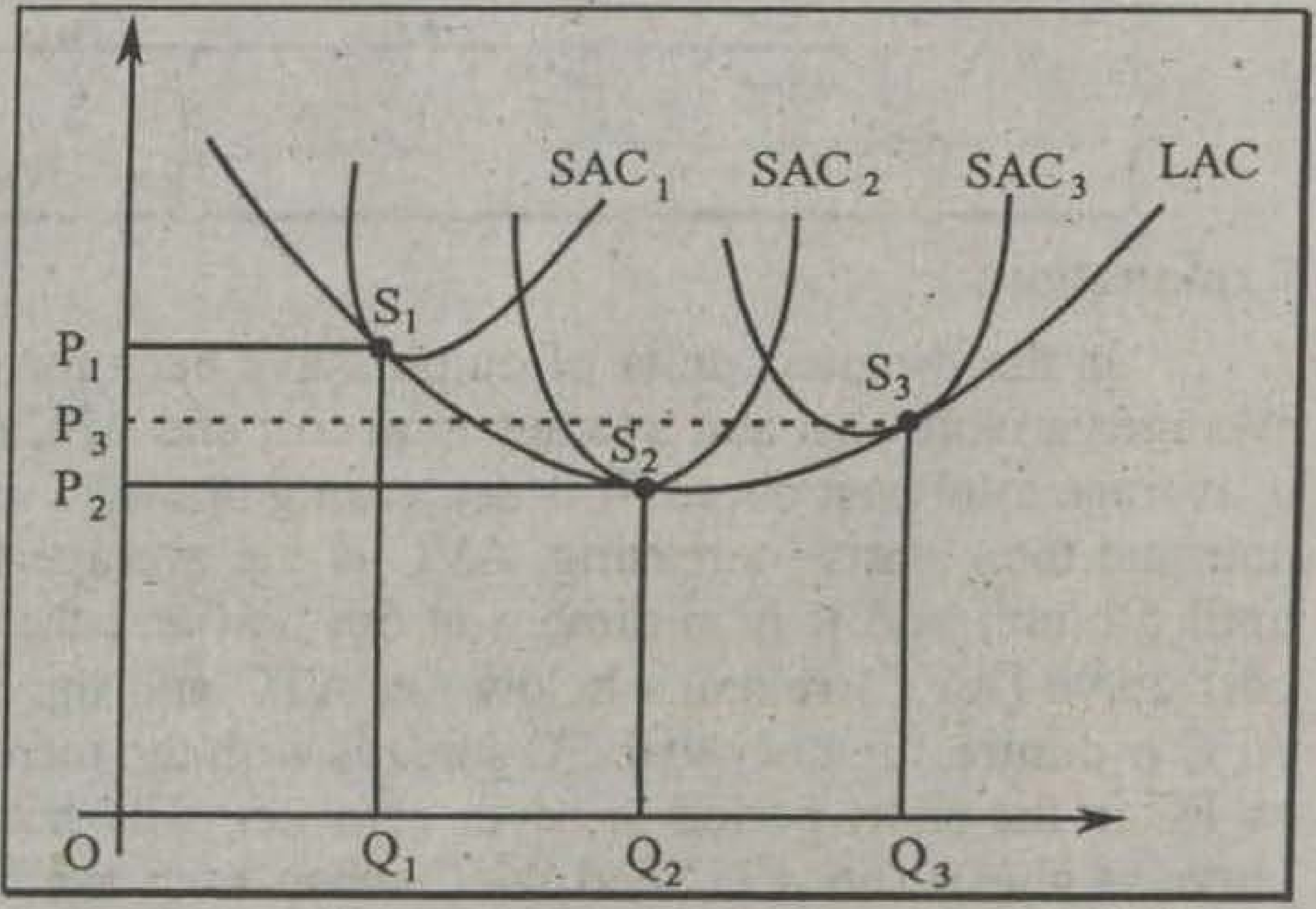
4. When AVC is falling, MC is also falling and MC is less than AVC curve. In the figure uptill 5th unit AVC curve is falling and MC curve is below the AVC curve.

5. The AVC curve is minimum at 6th unit and MC curve is intersecting AVC from below when it is minimum that is MC is equal to AVC at its lowest point.

6. AVC curve is increasing from 8th unit to 10th unit and MC curve is above the AVC curve which shows that when AVC increases, MC also increases but AVC increases at a slower rate than MC.

LONG RUN COST CURVES

Long run is the period which is long enough for a firm to be in a position to vary quantities of all inputs. Therefore, in the long run there is no fixed cost. Because in the long period fixed factors of production also become variable. A firm can easily build up any size of land and scale of production. Long run is the addition of the short run so the behaviour of the long run average cost curve is the same as of short run cost curve. Short run average cost curve diminishes first due to increasing returns, it touches minimum level and then starts increasing due to diminishing returns. As the long run is the addition of the short periods so the long run average cost curve first diminishes, touches minimum and then starts increasing. Suppose that a firm's short run average cost curves are given in the diagram below:

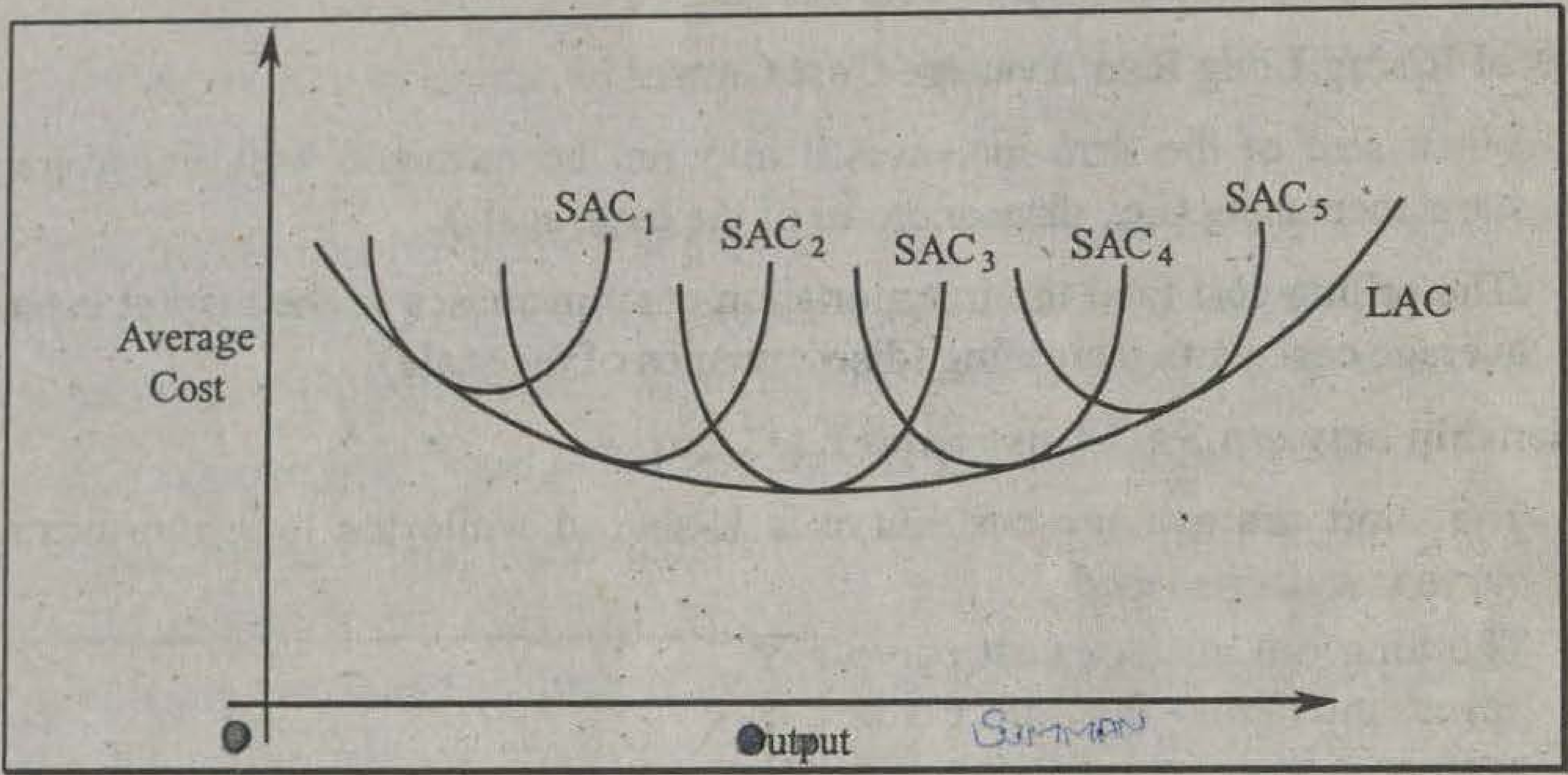


If short run average cost curve of the firm is SAC_2 then the optimum level of output is OQ_2 because cost at this output is minimum i.e., S_2Q_2. Suppose that a firm intends to increase its output up to OQ_3 in the short period it has average cost of S_3Q_3 because the scale of production in the short period is fixed. But in the long run a firm adopts many alternative techniques of production of producing goods or it can change the size of the plant. In the long run a firm can produce OQ_3 of output at P_3Q_3 average cost while in the short period it was only possible for a firm to produce at S_2Q_2 average cost. A firm in the long run can adopt three different scales of production i.e., it may be increasing returns to scale, constant returns to scale or decreasing returns to scale.

Long run average cost curve can be drawn from the addition of short period cost curves or if a tangential curve is drawn on all the short run cost curves we get the long run average cost curve or (LAC) is given by a curve tangent to all the short run average cost curves.

Derivation of the Long Run Average Cost Curve

The LAC shows that in the beginning, cost of production starts diminishing with an increase in output due to economies of scale and then it touches the minimum i.e., the cost of production becomes minimum and the firms remain for a longer period as against the short run and then cost of production starts increasing due to diseconomies of the scale.



Although the long run average cost curve becomes tangent to the short run average cost curves. Yet it does not mean that it will touch the minimum points of the short run average cost curves and when it touches the falling part of the short run cost curves and when it is increasing it becomes tangent with that portion of short run average cost curves which is increasing.

The long run average cost curve of the firm is also called the planning curve because this curve represents the costs at different level of outputs. The division of labour and expansion in output depend on the average cost of output.

WHY LAC IS FLATER?

The short run average cost curve is U-shaped. The shape of the LAC is the same that first it decreases, touches the minimum level and then starts increasing but it decreases and increases at a slower rate and when it touches the minimum points it remains for a longer period and the LAC becomes saucer shaped. The reason is that fixed factors of production become variable in the long run and the ratio of variable costs increases while that of fixed cost decreases and fixed cost per unit of output decreases and it becomes flater.

The size of the firm increases due to increase in the fixed cost of the firm and the firm takes advantage of large scale and average costs curve remains at minimum level for a longer period.

In the short period if output increases after a certain limit, the average variable cost starts increasing but in the long run the size of the firm can also be increased therefore, average variable costs do not increase at a faster rate as in case of short period.

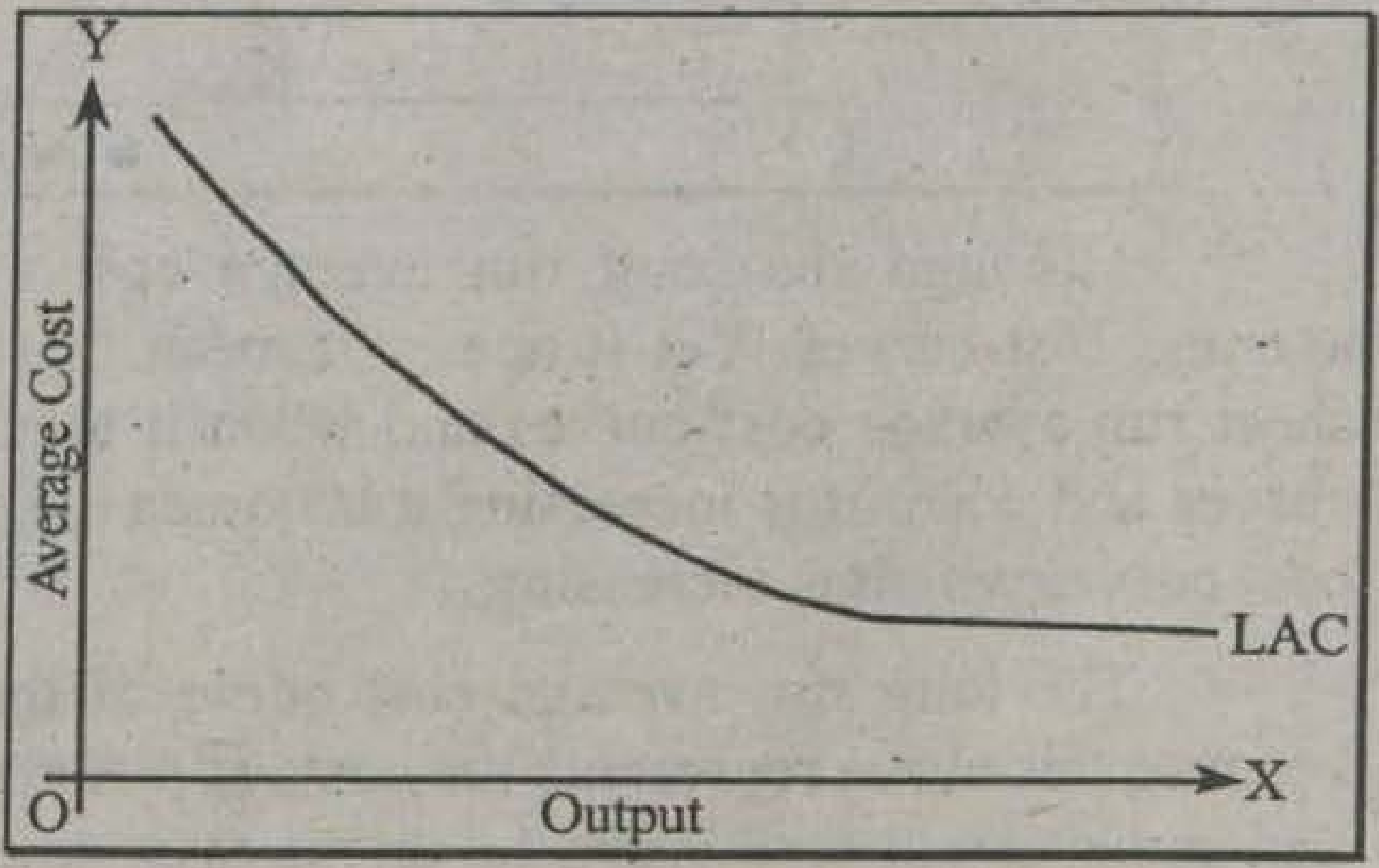
The factors combination in the long period becomes optimum, trained and efficient labour becomes available, capital at lower interest rate may be available and therefore, average costs diminish at a slower rate.

Causes of Rising Long Run Average Cost Curve

1. When size of the firm increases it may not be managed well and average cost starts increasing (i.e., diseconomies of the large scale).
2. The selling cost (and the transportation cost) increases as the market extends and average cost starts increasing (diseconomies of the scale).

Relationship between SAC Curve and LAC Curve

1. The short run average cost curve is U-shaped while the long run average cost curve is saucer-shaped.
2. The long run average cost curve never intersects the short run average cost curves but it becomes tangent to them.
3. The long run average cost curve keeps the short run average cost curves within itself that is why it is also called Envelope curve.
4. If the technology changes in the long run the shape of LAC becomes L-shaped as shown in diagram below:



REVENUE

Revenue is the amount which a firm/producer/businessman or a trader receives by selling his output. The difference between revenue and cost is profit.

Total Revenue

It is the total amount which is received by selling a specific quantity of output or it is the addition of the marginal revenues or total revenue is equal to the average revenue (price) multiplied by output sold. (i.e., Total Revenue = Average Revenue × Output sold).

OR

TR = Price × Output

Marginal Revenue

It is an addition made to the total revenue by selling one more unit of output or change in total revenue as a result in unit change in scale. Suppose that total revenue by selling 5 units of output in Rs. 130 and the total revenue by selling 6 units of output is Rs. 145, marginal revenue i.e., revenue of 6th unit is Rs. 145 – 130 = 15.

OR

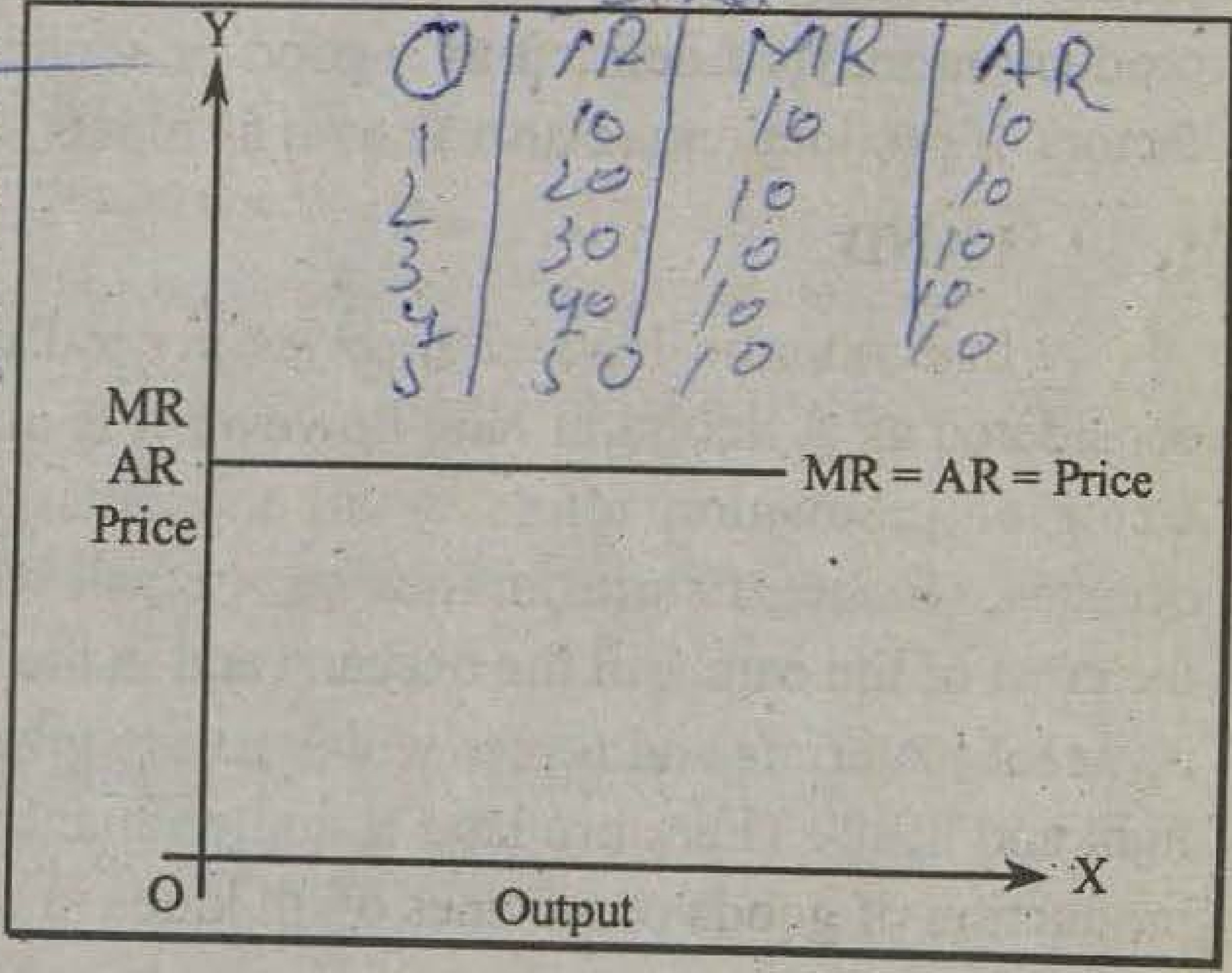
MR shows rate of change in total revenue because of per unit change in output.

Average Revenue

It is the revenue per unit of output i.e., AR = TR/Q where TR is total revenue and Q is output. Since TR = Price × Output so it may be written as AR = PQ/Q = Price where PQ means price into quantity and Q is output sold. That is average revenue equals prices.

Shape of Marginal and Average Revenue under Perfect Competition

Under perfect competition none of the firm is able to influence the prevailing price in the market it can only change its output, because under perfectly competitive market there are very large number of buyers and sellers, units of a commodity sold are homogenous, consumers and producers are aware of the market situation. There is perfect mobility of factors of production, transportation cost is negligible and there is free entry and exit of firms hence, the price of commodity is not only homogenous but is minimum. Each of the firms under perfect competition can provide very small quantity of total output so a firm can sell his commodity at the prevailing price only. Hence firm can sell its commodity at the prevailing price only. Firm's average and marginal revenue can be explained with the help of a diagram.

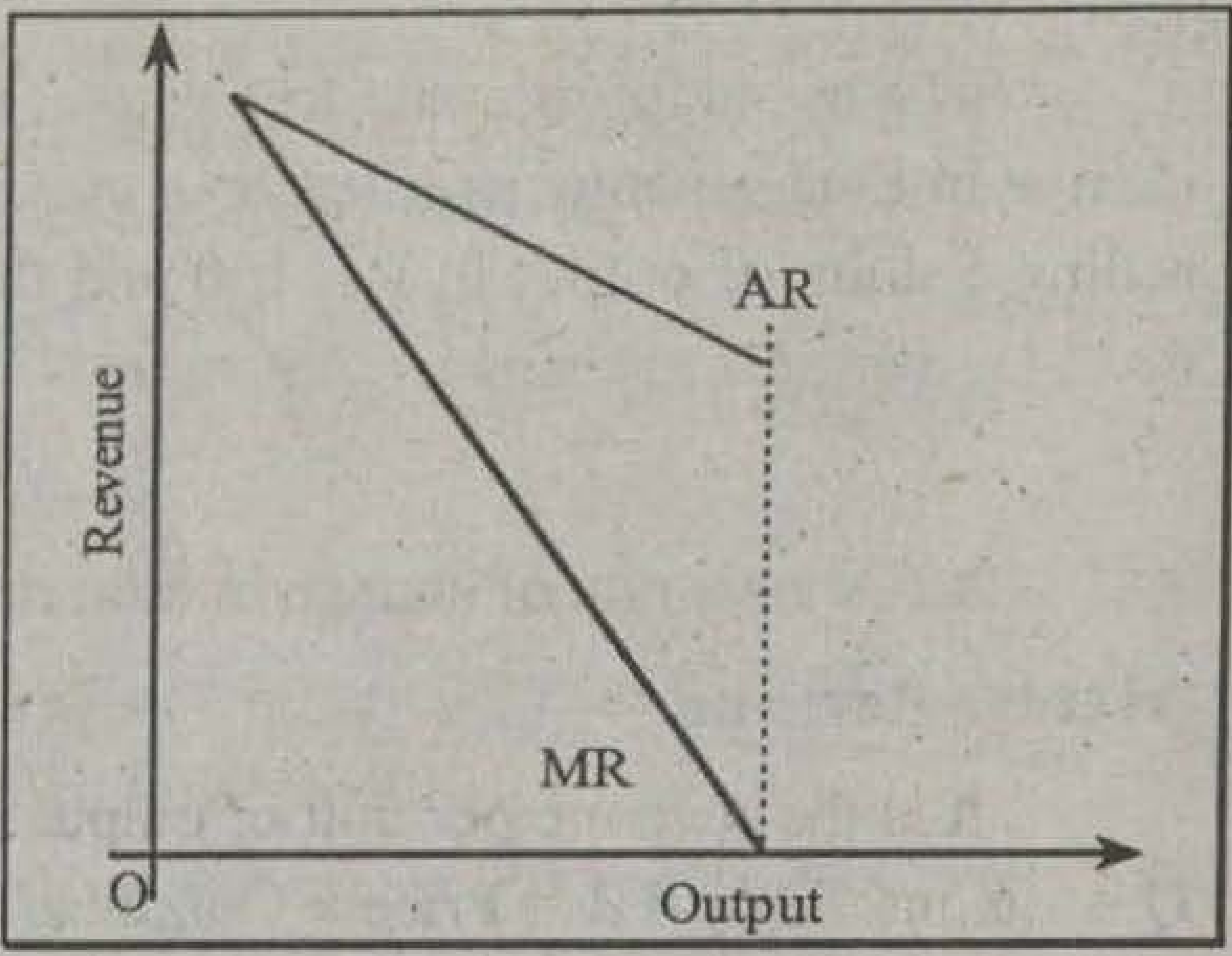


Units of output sold have been measured on x-axis and revenue on y-axis. TR is the total revenue curve which has positive slope. MR and AR are the marginal and average revenue curves respectively. MR is equal to AR and it is equal to price which shows that none of the firm under perfect competition can change the price. The MR and AR curves are parallel to x-axis which shows a firm cannot change its price while a firm can change its output.

① There is a large no of buyes and selleres.
② Homogeneous

SHAPE OF MR & AR CURVES UNDER IMPERFECT MARKETS

Under imperfect market, as the number of sellers are not very large even the sellers may be very small in number. There may be agreement and price cartels under imperfect market, the firms have the ability to control supply and price both as a result these firms may be charging higher price for their product but it may decrease demand for their product so, to sell more output firms have to reduce the price and ultimately there will be a downward trend in the MR & AR curves as shown in the diagram.



FACTORS OF PRODUCTION

Production is process of combination of four factors of production i.e., land, labour, capital and organization. None of the production process either related to agriculture, industry, minerals etc., can be started without there factors of production. Similarly it is not possible to start production process with three, two or single factor of production. Therefore, a factor of production is dispensable for production. A factor of production may be defined as a good or service which is required for production. There factors of production are also known as inputs for production.

1. LAND

In economic laws & theories generally land as a factor of production has been considered as agricultural land however it is used in a wider since in economics. Land as factor of production refers to all the gifts of nature e.g., rivers, mountains, forests, occeans, climate, fishries, mines etc. i.e., all which found on the crest of the earth, under the crest of the earch, in the occeans and in the air. According to Alfered Marshall by land is meant materials and forces which nature gives freely for man's aid, in land water, in air, light and heat". Therefore land is an important factor of production which is helpful in the production of goods & services of all kinds in one way or way or the other.

2. LABOUR

Labour refers to physical and mental exertion or work under taken for some monetary rewards. Any mental and physical exertion or workdone without the consideration of money incentives does not refer to labour. Labour includes the services of Workers, Accountants, Engineers, Doctors, Advocates, Teachers and all those who are getting predetermined rewards for their services. The reward for labour is wage.

3. CAPITAL

Capital refers to all man made productive resources i.e., all types of goods which are used for further production or responsible for increasing revenue and profits. Generally raw material, plants machinery, transportation and communication means (i.e., Roads, Railways, Air Transportation, Shipping, Telephone, Fax, Raid, T.V and Computers). The portion of the capital such as raw materials i.e., which looses its shape during production is known as working capital and the goods which maintain their entity during production such as plant & machinery, equipments and other instruments are known as fixed capital. The reward of capital owners is called interest.

4. ORGANIZATION

Organization refers to the services of an enterprenuer who decides about the level of output, cost of production, revenue and the method of production. As already explained above that none of the production process can not be started with customary three factors of production therefore, who hires the services of labour and paying wages services of land and paying rent, services of capital and paying interest is known as organisation. This factor of production is not receiving predetermined reward like other factors of production. He also undertakes the risk. Profit is the reward of organisation.

CHARACTERISTICS OF LAND

Land possess the following characteristics:

1. It is a free gift of nature.
2. The area of land is fixed i.e., it does not go any changes.
3. Land is indestructible i.e., permanent in nature.
4. Land is the basic and important factor of production.
5. Land is a passive factor of production i.e., it cannot produce anything itself.
6. Land is inomovable.
7. It has original and indestructible powers i.e., fertility of land.
8. Land differs in fertility and locality.
9. Supply of land is inelastic i.e., unchanged to a change in demand for land.
10. Land has alternative uses e.g., agriculture industry, roads etc.

CHARACTERISTICS OF LABOUR

1. Labour is perishable i.e., services of labour can not be stored.
2. Labour cannot be separated from the labour.
3. Labour is more mobile than capital and other factors.
4. Bargaining power of labour is weak because supply of labour is greater than the demand level of education is low and are not aware of their marginal productivity and efficiency.

5. Demand for labour depends on the demand for goods produced with the help of labour.
6. In a country supply of labour is inelastic at a particular time period.
7. Every labour has its own habbits, liking and feeling labour is human being not a machine.
8. Labour sells its services not himself.
9. Generally increase in wages increases the supply of labour but beyond a certain limit supply of labour is reduced with the increase in wages.
10. Labour is both the beginning and the end of production process.
11. Efficiency of labour is different because each labourer is different in physical health and mental capacities.
12. Demand for labour is indirect.
13. Demand for labour depends upon the demand of other factors of production and rewards of labour depends on the rewards of other factors of production.
14. It is difficult to assess the cost of production of labour in a production process independently.
15. Labour creates capital.
16. Labour is an active factor of production.

DIVISION OF LABOUR

When the production process is split up into different parts and a large number of workers come together to complete the work white the contribution of each worker is unknown it is called simple division of labour. When the production process is split up into different parts and each part is performed by different workers it is known as complexed division of labour. If the division of labour is based on their occupation and specialization it is said to be occupational division of labour or specialization.

ADVANTAGES OF DIVISION OF LABOUR

1. Increase in production capacity.
2. Increase in efficiency of labour.
3. Increase in skill particular education and experience.
4. Increase in mobility of labour.
5. Efficient use of modern techniques of production i.e., plants and machineries.
6. Increase in employment opportunities because of specialsation.
7. Work according to the taste of labour becomes possible and consequently increases efficiency and production.
8. High rate of capital formation because of more employment.

9. Quality of goods improves.
10. Minimises cost of production.
11. Saving of time and spirit of cooperation among the workers.

FUNCTIONS OF THE ENTREPRENEUR

Certain and specific functions are performed by the entrepreneurs as given below:

1. Planning for the production i.e., determining level of output, cost of production, price of goods produced and profits of the firm.
2. Hiring the services of land, labour and capital.
3. Purchase of raw materials and machinery.
4. To coordinate among the factors of production.
5. To maintain quality of the product, to introduce new and better techniques of production, managing sale of goods and market exploration.
6. Entrepreneur makes arrangements for introducing innovations which help in increasing production on one hand and reducing cost on the other hand.

CHARATERISTICS OF CAPITAL

1. Physical capital is not a free gift of nature but it is man made i.e., it is produced in production process.
2. Like labour capital is a passive factor of production i.e., it does not produce itself.
3. Capital is composed of working capital (raw materials) variable and fixed capital (plants & machinery). It is more mobile than other factors of production. i.e., land organization.
4. There is a loss of value of capital i.e., depreciation during its use. i.e., capital consumption.
5. Capital is destructible.

Factors Reducing Mobility of Labour

1. Trade union bariers.
2. Professional bariers where associations restrict the entry by means of examination and trainings.
3. Lack of knowledge about employment opportunities.
4. Cost of living between different regions.
5. Non monetary considerations e.g., love of land, old friends, customs and traditions, social life differences.
6. Natural ability required in different jobs.
7. Linguistic problems in different regions.

8. Job discrimination may be either on the basis of regions areas, provinces, sex or race.
9. Lack of facilities and low purchasing power in other area.
10. Political reasons.
11. Wage differentiates.

Labour Productivity

Labour productivity is defined as the output per worker over a given period of time. There are several **factors which influence the productivity of labour** which are as follows:

(a) The quality of the labour force.

(b) Combination with other factors of production i.e., the quality and the quantity of other factors of production with labour is combining.

(c) Imposition of taxes on the labour class.

(d) The degree and rate of economic growth, economic welfare, economic prosperity, education and training.

(e) The economies of the scale under which the production process is operating.

SHORT QUESTION ANSWER

Q.1 Define the concepts of total product, marginal product and average product.

Ans. **Total Product:** Total product means the total amount produced during some period of time by all the factors of production that the firm used.

Average Product: Average product is merely the total product per unit of the variable factor.

Marginal Product: Marginal product is the change in the total product resulting from the use of one more (or one less) unit of the variable factor.

Q.2 Give brief relationship between marginal product and total product.

Ans. **Relationship between Marginal Product and Total Product:** As the total product is addition of marginal products therefore, as MP is increasing, TP will increase and when MP = 0, TP should be maximum and when MP becomes negative, T.P starts decreasing.

Q.3 Give brief relationship between marginal product and average product.

Ans. **Marginal Product and Average Product:** AP is derived by dividing the TP to units of variable FOP and TP is the addition of the MP therefore, the behaviour of MP and the AP will be the same however the increasing and diminishing rate of marginal is always faster than the average i.e., average increases or decreases at a slow rate while marginal's of change is always faster.

Q.4 Discuss in brief the concept of cost of production.

Ans. **Cost of Production:** By cost of production means that all those expenditures incurred during the production process either these are directly or indirectly related with the production, these include the rent paid to the land owners or other property used, wages of labour, interest on capital, profits of the entrepreneur, cost of raw materials and replacement and repairing charges of machinery.

Q.5 Define fixed costs/indirect costs or supplementary costs.

Ans. **Fixed Costs and Variable Costs:** Fixed costs are also called the supplementary costs or indirect costs. Fixed costs are all those costs which have to borne even when the output is zero or temporarily stopped. Fixed costs do not vary with the output. Fixed costs include cost of plant and machinery, rent of land or building, salaries of permanent administrative staff and interest on capital. Fixed costs are independent of output generally fixed cost is incurred in hiring factors of production whose amount cannot be altered in the short period.

Q.6 Define variable costs / direct costs or prime costs.

Ans. Variable costs are also called the direct or prime costs. Variable costs are those expenditures of production which vary directly with the output. Variable costs

increase with the increase in output and decrease with the decrease in output and when output is zero, variable costs are e.g., cost of raw materials (primary and finished), electricity expenses, gas charges, water, telephone expenses and transport expenses.

Q.7 Write short note on short period costs and long period costs.

Ans. **Short Period and Long Period Costs:** Short period is a period within which the firm cannot vary fixed factor of production such as plant and machinery, rent of land and building, salaries of permanent staff, overhead charges and interest on capital. Long period is a period within which the firm can vary not only the variable factor of production but also the fixed factor of production. The costs incurred on the variable as well as on the fixed factor of production are called the long run costs.

Q.8 Define total costs.

Ans. **Total Costs:** The total expenditures incurred in producing a specific quantity of output are called the total costs or total cost is equal to total fixed costs plus total variable costs.

Q.9 Differentiate average total costs average variable costs and average fixed costs.

Ans. **Average Total Costs (ATC):** It is the cost per unit of output, it may be derived as ATC = TC/Q where Q is the output and TC is the total cost or average total cost is equal to the addition of average fixed costs average and the variable costs.

i.e., $ATC = AFC + AVC$

Where AFC is average fixed cost and AVC is average variable cost.

Average Variable Cost (AVC): It is the variable cost per unit of output. It may be derived as AVC = VC/Q where Q is output and VC is the variable cost. OR average variable cost = average total cost (–) average fixed cost.

i.e., $AVC = ATC - AFC$

Average Fixed Cost (AFC): It is the fixed cost per unit of output. It may be derived as AFC = FC/Q. Where Q is the output and FC is the fixed cost. OR average fixed cost = average total cost – average variable cost because fixed cost = total cost (–) variable cost.

i.e., $AFC = ATC - AVC$

Q.10 Define marginal cost.

Ans. **Marginal Cost (MC):** The cost incurred in producing one more unit, next unit or the last unit of output is called the marginal cost. OR It is the change in the total variable cost by the employment of one more unit of variable factor of production.

Q.11 Define and differentiate fixed costs and variable cost.

Ans. **Fixed Costs (FC):** It is the portion of the total cost which does not vary with the output. Wheather output is increasing or decreasing.

Variable Costs (VC): It is the portion of total costs which varies directly with the output.

Q.12 Why a long run average cost curve first-diminishes, remains a minimum level and then starts increasing?

Ans. **Long Run Average Cost Curve:** Long run is the addition of the short runs so the behaviour of the long run average cost curve is the same as of short run cost curve. Long run is the addition of the short periods so the long run average cost curve first diminishes, touches minimum for along time and then starts increasing.

Q.13 Why long run average cost curve is flatter?

Ans. **Why Lac is Flatter:** The reason is that fixed factors of production become variable in the long run and the ratio of variable costs increases while that of fixed cost decreases and fixed cost per unit of output decreases and it becomes flatter.

Q.14 Why a long run average cost curve starts rising?

Ans. **Causes of Rising Long Run Average Cost Curve:**

1. When size of the firm increases it may not be managed well and average cost starts increasing. (i.e., diseconomies of the large scale).
2. The selling cost (and the transportation cost) increases as the market extends and average cost starts increasing.
3. Decreasing returns to scale.

Q.15 Describe relationship between short run average cost curve and long run average cost curve.

Ans. **Relationship between SRAC Curve and LRAC Curve:**

1. The short run average cost curve is U-shaped while the long run average cost curve is saucer-shaped.
2. The long run average cost curve never intersects the short run average cost curves but it becomes tangent to them.
3. The long run average cost curve keeps the short run average cost curves within itself that is why it is also called Envelope curve.
4. If the technology changes in the long run the shape of LRAC becomes L-shaped.

Q.16 Define revenue and total revenue.

Ans. **Revenue:** Revenue is the amount which a firm/producer/businessman or a trader receives by selling his output. The difference between revenue and cost is profit.

Total Revenue: It is the total amount which is received by selling a specific quantity of output or it is the addition of the marginal revenues or total revenue is equal to the average revenue (price) multiplied by output sold. (i.e., Total Revenue = Average Revenue × Output sold or TR = P.Q).

Q.17 Differentiate marginal revenue and average revenue.

Ans. **Marginal Revenue:** It is an addition made to the total revenue by selling one more unit of output or change in total revenue as a result in unit change in output sold.

Average Revenue: It is the revenue per unit of output i.e., AR = TR/Q where TR is total revenue and Q is output. Since TR = Price × Output so it may be written as AR = PQ/Q = Price where PQ means price into quantity and Q is output sold. That is average revenue equals prices.

Q.18 Differentiate between the marginal revenue and average revenue under perfectly competitive market.

Ans. **Shape of Marginal and average Revenue under Perfect Competition:** Under perfect competition none of the firm is able to influence the prevailing price in the market it can only change its output. The price of commodity is not only homogenous but is minimum. Each firm under perfect competition can supply very small quantity of total output so a firm can sell his commodity at the prevailing price only. Therefore;

$$MR = AR = Price$$

Q.19 Define the concept of opportunity cost.

Ans. **Opportunity Cost:** The opportunity cost of an action is the value of the forgone alternative action. Opportunity cost can only arise in a world where the resources available to meet wants are scarce, so that all wants cannot be satisfied. If resources are unlimited no action would be at the expense of any other, all can be under taken and the opportunity cost of any single action, the value of the "next best" alternative, would be zero. In real world opportunity cost is positive.

Q.20 Write short note on land as a factor of production.

Ans. **Land:** According to Alfered Marshall by land is meant materials and forces which nature gives freely for man's aid, in land water, in air, light and heat".

Q.21 Write short note on labour.

Ans. **Labour:** Labour refers to physical and mental exertion or work under taken for some monetary rewards. Any mental and physical exertion or workdone without the consideration of money incentives does not refer to labour.

Q.22 Write short note on capital and differentiate working capital and fixed capital.

Ans. **Capital:** Capital refers to all man made productive resources i.e., all types of goods which are used for further production or responsible for increasing revenue and profits. Generally raw material, plants, machinery, transportation and communication means.

Working Capital and Fixed Capital: The portion of the capital such as raw materials i.e., which looses its shape during production is known as working capital and the goods which maintain their entity during production such as plant & machinery, equipments and other instruments are known as fixed capital. The reward of capital owners is called interest.

Q.23 Write short note on organization.

Ans. **Organization:** Organization refers to the services of an entrepreneur who decides about the level of output, cost of production, revenue and the method of production. This factor of production is not receiving predetermined reward like other factors of production.

Q.24 Define division of labour and specialization.

Ans. **Division of Labour:** When the production process is split up into different parts and a large number of workers come together to complete the work while the contribution of each worker is unknown it is called simple division of labour. When the production process is split up into different parts and each part is performed by different workers it is known as complexed division of labour. If the division of labour is based on their occupation and specialization it is said to be occupational division of labour or specialization. Specialization occurs when a worker is doing one type of job or provides one type of service while division of labour occurs in single industry.

Q.25 Define capital formation.

Ans. **Capital Formation:** It is the addition made to the stock of capital quantitatively and quantitatively. The rate of capital formation depends on the level of investment and savings in the economy. Sources of capital formation are domestic savings and feign aid etc.

EXERCISE

Q.1 Define total products average product and marginal product. Explain inter relationship between marginal product and total product and marginal product and average product with the help of a schedule and a diagram. OR

Prove that when marginal product is zero, total product is maximum and when average product is maximum, marginal product is equal to average product. Show with the help of a schedule and a diagram. OR

Given the total product schedule of a business. Find marginal and the average product and show inter-relationship between marginal product and total product and marginal product and average product.

Units of Variable FOP	1	2	3	4	5	6	7
Total Product	5	15	30	40	45	45	40

Q.2 What do you understand by cost of production? Distinguish between prime cost and supplementary cost by giving examples. Short period cost and long run cost.

OR

Distinguish between fixed and variable costs, short run costs and long run costs.

OR

Differentiate between the following giving examples:

(a) Direct cost and indirect cost.

(b) Short period cost and long period costs.

Q.3 Explain the illustrate the concept of:

(a) Total cost (b) Average Total Cost

(c) Average Variable Cost

Also bring out relationship between marginal cost, average total cost and average variable cost. When they are lowest.

OR

Distinguish between the average cost and marginal cost. Show with the help of a table and diagram that marginal costs and less than average cost, if average cost are falling and more than average costs, if average costs are rising.

OR

What are the cost curves. Explain their inter-relationship with the help of a schedule and diagram. OR

Given the following cost schedule. The fixed cost of the firm is 50. Find the marginal cost, average total cost, average variable cost, average fixed costs and explain them with the help of diagrams.

Q.4 Drive the long run average total cost curve from the short run average total cost curves. Why long run average total cost curve is flatter. Give inter-relationship between LRAC and SRACs. OR

How long run average total cost is derived? Why it is called envelop curve? What is difference between SRACs? When LRAC is L-shaped instead of saucer shaped.

Q.5 Explain the concept of marginal revenue, average revenue and total revenue. What is shape of marginal revenue average revenue and the total revenue. What is shape of marginal revenue and average revenue curves in perfect competition and monopoly.

Q.6 Write short note on the following:

(i) Minimum efficient scale (MES).

(ii) Imperfections in the market for capital.

(iii) Immobility of labour.

(iv) Factors influencing labour productivity.

✿ ⑥ ✿

CHAPTER 7

MARKET

Generally by market we mean a place or an area where goods are exposed for sale or anybody of persons who are in intimate business relations and carry on extensive transaction in any commodity. But the word 'market' is used in wider since in economics. "According to Cournot" Economists understand by the term market not any particular market place in which things are bought and sold but the whole of any region in which buyers and sellers are in such free intercourse with one another that the price of the same goods tends to equality easily and quickly. It is not necessary that the buyers and sellers have personal contacts. The free intercourse of buyers and sellers may be by means of telephone, telegraph, postal service, News papers, Radio, TV internet or any other mean. The necessary conditions of market are:

(a) Existence of commodity which is dealt with.

(b) The existence of buyers and sellers.

(c) One price should prevail for the same commodity at the same time.

(d) Place, area, certain region or the whole world.

SIZE OF THE MARKET/EXTENTION OF MARKET

Size of market depends on several factors. Size of the market means whether demands for a commodity comes from nearer places or from far of places. If the demand of a commodity is low, the commodity will be sold in nearby places and its market will be limited and if the demand comes from far of places, the market of that commodity will be wider.

1. Nature of Demand

If the demand for a commodity is more, the market is wider and if the demand for a commodity is low, the market is limited. A commodity which is in universal demand e.g., gold, silver, diamonds, dollars and sterling pounds etc., will have a wider market. A commodity is generally consumed in the world, the market is wider and vice versa.

2. Character of the Commodity

The market for those goods which are durable, portable and are suitable for sampling and grading is wider because these commodities can be sent to far of places. The goods whose supply can easily be increased with the increase in demand, the market is wider. The market for perishable goods and those commodities which are not suitable for sampling and grading, the market is limited. If the supply cannot be increased easily with the increase in demand, the market is limited.

3. Means of Transport and Communication

The size of the market also depends on means of transport and communication. If the means of transport and communication are developed the market is wider and if the means of transport and communication are under developed the market will be limited. Because developed transport and communication system enables the goods to be carried to long distances and establish wider contacts between buyers and sellers.

4. Peace and Security

Extent of market depends on peace and security in and outside the country. Goods cannot be transported to the far of places of the country unless there is peace and security. During peace in and outside the country the buyer and sellers can make contacts without any danger of fall in price and their amount.

5. Weight and Value

The market for those goods which have more weight and less value, the market is limited e.g., bricks, sugarcane etc., The market for those goods which have more value and less weight, the market is wider.

6. Scale of Production

If the goods are being produced at large scale and principle of division of labour is adopter the market is wider and if goods are produced on a small scale, the market is limited.

7. Policy of the State

If the state does not impose restrictions on free import and export of goods the market is wider and if state imposes higher import and export duties the market is limited. If the progressive taxation system is adopted i.e., tax rate increases with the increase in income and the ratio of taxes is as such that little amount is left over as profits the market will be limited and vice versa.

8. Currency and Credit System

The size of market depends on currency and credit system if the currency and credit system are developed the market is wider because marketing can be easily, conveniently and profitable to be carried on over longer distances. The Commercial Banks, Industrial Banks, Agricultural Banks, Co-operative Banks and other credit institutions play an important role in the expansion of the market. The big profits can not

be completed without the help of Banks. The Banks make the business transaction easy and convenient. Without the Banks internal and external receipts and payments may become difficult and even impossible and hence, there will be no national and international trade.

CLASSIFICATION OF MARKETS

The markets can be classified as follows:

(a) According to area.

(b) According to time period.

(c) According to nature of competition.

(d) According to nature of commodity.

1. According to Area

There are four types of markets according to area:

(a) Local Market
(b) Regional Market
(c) National Market
(d) International Market

(a) Local Market

The market of those goods which are sold in the area where they are being produced is called local market. It is generally a market of those goods which have more weight and less value or these are perishable because in case of goods having more weight, the transportation cost is much higher and in case of perishable goods these cannot be stored for a longer period.

(b) Regional Market

The market of those goods which are bought and sold in a specific area or region is called regional market e.g., Peshwari Turban, Sindi Ajrak, Punjabi Dhoti and Baluchi dress etc.,

(c) National Market

The market is said to be national when goods are bought and sold in the country. These goods normally have less weight and more value, are durable or those goods whose demand is more and price is homogeneous in the country.

(d) International Market

Those goods which are imported or exported the market for them is international.

2. According to Time Period

There are three types of markets according to time period.

(a) Day to Day Market
(b) Short Period Market
(c) Long Period Market

(a) Day to Day Market

The market where the whole product is sold in a day is called the day to day market. Price in this market is determined through the forces of demand and supply daily. The goods sold in this market are generally perishable or which cannot be stored e.g., vegetables, milk and fish etc. In this market the supply in a day is fixed, if the demand increases price also increases and vice versa.

(b) Short Period Market

Short period market is that market where supply of goods can be increased upto some extent with an increase in demand. In this period fixed factor of production can not be changed. It is only the variable factor of production which can be either increased or decreased. The supply can be increased only by increasing the number of labour and raw material. In this market demand for goods is more effective than the supply because supply can only be increased upto some extent. Price in this market is determined through the forces of demand and supply in the short period.

(c) Long Period Market

Long period is a period in which not only the variable factor of production but also the fixed factor of production can be changed. In the long period market supply is more effective than the demand because price is determined keeping in view the supply. In this market with a change in demand, supply can also be changed. Price in this market is determined through the forces of demand and supply in the long period.

3. Perfect and Imperfect Markets

Perfect market is that market which fulfils these conditions:

(a) Very large number of buyers and sellers.

(b) Units of goods sold are homogeneous.

(c) Consumers are aware of the market situation.

(d) Perfect mobility of factors of production.

(e) Free entry and exist of firms.

(f) Transportation cost in negligible and as a result price of all the units of a commodity sold is the same and it is minimum.

The market where there are not large number of buyers and sellers, units of commodity are not homogeneous, people have no knowledge of price, the goods are differentiated, there is a shortage of firms and factors of production are not perfectly mobile is called imperfect market. In this market price may be same but it is not minimum.

CONDITIONS OF PERFECT MARKET

(i) Very Large Number of Buyers and Sellers

One of the conditions of pure market is that there are very large number of buyers and sellers so that none of the seller or buyer will be able to influence the market price because in perfect competition a firm supplies only a small portion of the total supply and none of the buyer can influence price by varying its own demand. When the sellers are in large number they cannot make agreement and cannot charge higher price. Perfect competition exist when each seller intends to sell more and more of its output and charges minimum price. The sellers will try to reduce cost of production to charge minimum price.

(ii) Homogeneous Goods

Pure competition in the market can only exist when all the firms are producing homogeneous units of a commodity i.e., the units are standardised or identical in their characteristics. Colour, size, weight, volume, shape, label and brand so that the consumers do not differentiate between the different units of commodity.

(iii) Free Entry and Exist of Firms

Pure competition can only exist in the market when there are no barriers for new entry of firms and exist e.g., when the profit rate is higher, those firms which intend to start business there should be no barrier and during depression when a firm intends to back out, there should be no legal handing on the firm. Hence, none of the firm can earn abnormal profits or can bear losses for a longer period.

(iv) Knowledge of Market Situation

Another condition of perfect competition is that buyers and sellers are aware of the market prices. If the buyers are not aware of prices prevailing in the market same price cannot rule in the market for the same commodity.

(v) Perfect Mobility of Factors of Production

Same price can rule in the market for the same commodity when there is perfect mobility among those factors of production which are producing that commodity. If the demand of factor will move to that industry and in other case the factors of production will back out from that industry hence the rewards of factors of production in one industry will be equal and cost of production being equal each firm in the pure competition will charge the same price.

(vi) Absence of Transportation Cost

Same price can only rule in the market for the same commodity when there is no transportation cost. In the presence of transport cost the prices must differ to that extent in the different areas, places and sectors of the market.

CONDITIONS OF IMPERFECT MARKET

(i) No Knowledge of Price

In imperfect market consumers are not aware of the prices. They do not search for the low priced product and buy from nearly areas at high price.

(ii) Differentiated Product

Another feature of imperfect market is that all the units of commodity are not homogeneous but are differentiated hence, same price cannot exist in the market.

(iii) Shortage of Firms

In perfect competition there are very large number of firms and each firm supplies a small portion of the total supply and hence can not influence the prevailing price in the market. In imperfect market, in case of monopoly there is only one firm, in case of oligopoly there are few firms and in case of monopolistic competition there are many firms but not large. They can sell their goods by means of agreements contracts and price cartles and hence, can charge high price.

(iv) Factors are not Perfectly Mobile

As the factors are not perfectly mobile hence cost of production for the same commodity differs indifferent markets and producers charge different prices.

(v) Price Policy

In perfect competition firms follows the price policy but under imperfect market each firm has its own price policy. i.e., under perfect competition firms are price taker and under imperfect market firms are price maker.

(vi) Demand Curve

The demand curve under perfect competition is perfectly elastic while in imperfect market it is responsive to changes in price.

4. ACCORDING TO NATURE OF COMMODITY

There are four types of markets according to nature of commodity:

(a) General Market
(b) Specialized Market
(c) Marketing by samples
(d) Marketing by grades

(a) General Market

The market where all types of goods are bought and sold is called general market. The people come from nearby places to buy and sell and price is determined through demand and supply.

(b) Specialized Market

The market where only a single commodity is sold e.g., in fruit market only fruits and vegetables are sold, in Azam Cloth Market only cloth is sold etc.

(c) Marketing by Samples

The market where the buyers need not to check the whole quantity they just examine the samples. Generally agricultural products and raw materials are sold in this market. Different standards/samples/ of goods are prepared and people go through these standards/samples.

(d) Marketing by Grades

In this market goods are sold by grades. Grades of goods are prepared and sometimes only a number is alloted to a grade and people understand by that number e.g., Ari 6, P.K. 78. P.K. 76 and Karnal Basmati are different grades of rice and rice is sold under these grades.

EQUILIBRIUM OF THE FIRM AND INDUSTRY

Equilibrium means a state of balance when forces acting in opposite directions are exactly equal. A firm is said to be in equilibrium position when there is no incentive for a firm either to expand or to contract its output. A firm changes its output when its total profits are not maximum. The basic aim of the entrepreneur is maximum profits therefore, it will expand its output when higher profits are expected and contracts its output when it considers that increased output will decrease the profits. Hence, a firm is in equilibrium position when it is earning maximum profits. By maximum profits does not mean that it should adopt illegal ways but to decrease the cost of production and increase the total revenue by expanding its output i.e., widens the gap between total revenue and total cost.

Before explaining firm's equilibrium we make the following assumptions:

1. The basic aim of the entrepreneur is to maximise profits.
2. Firm is producing only a single commodity.

The difference between total revenue and total cost is called profit hence, the level of output where firm's total revenue and total cost difference is maximum, the firm will be in equilibrium.

RULES FOR PROFIT MAXIMISING

Rule No. 1

A firm should not produce at all if, for all levels of output, the total variable cost of producing that output exceeds the total revenue derived from selling it or, equivalently, if the average variable cost or producing the output exceeds the price at which it can be sold.

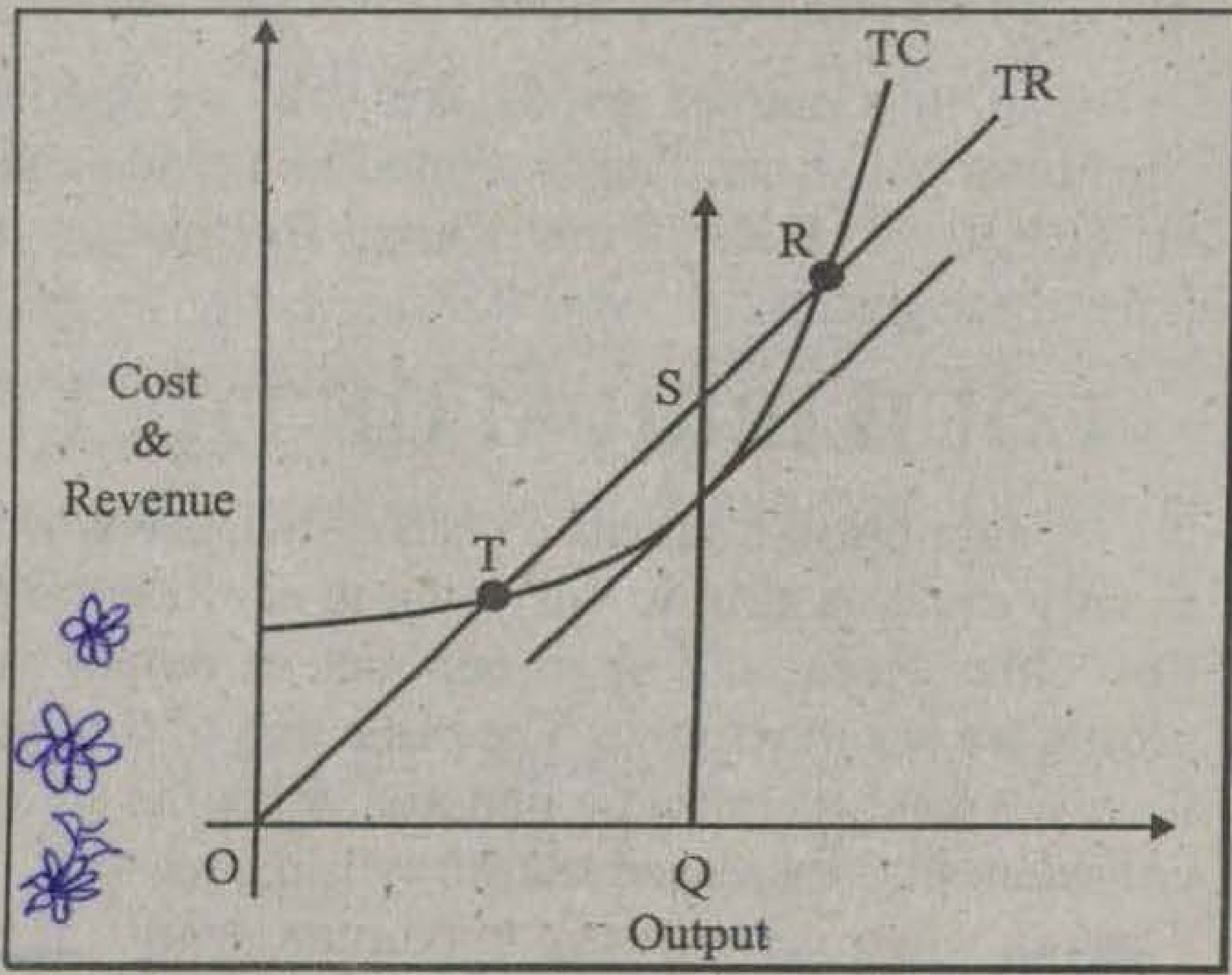
Rule No. 2

Assuming that it is worthwhile for the firm to produce, the firm should produce the output at which marginal cost equals marginal revenue.

Rule No. 3

For output where marginal cost equals marginal revenue to be profit maximising rather than profit minimising, it is sufficient that marginal cost be less than marginal revenue at slightly lower outputs and that marginal cost exceed marginal revenue at slightly higher outputs.

ACCOUNTANTS VIEW OF EQUILIBRIUM OF FIRM:



Equilibrium of the firm with the help of total revenue and total cost curves can be explained in figure, units of output are measured on x-axis and total revenue on y-axis. TC is the total cost curve and TR is the total revenue curve of a hypothetical firm. Total cost curve does not starts from the origin because a firm has to bear a portion of the total cost even if the firm is not producing its output. To the left hand side of point T, total cost is greater than the total revenue so firm will not produce because the basic aim of the firm is to maximise profits. At point T, firm is earning neither profit nor facing losses because at point T, total revenue is equal to total cost. (Where two curves intersect each other at the point of intersection they are equal) this point is called the break even point. To the right side of point T, again both the total revenue and the total cost are equal and towards right of point R again total cost is greater than total revenue. Point R is also called the break even point. The firm will neither produce output to the left of T nor to the right of R hence, the firm will produce between the points T and R. The firm's profits are maximum where the difference between total revenue and total cost is maximum i.e., the vertical distance between the total revenue and total cost curve is maximum and the optimum output is OQ.

Although this method is easy yet it is difficult to find that level of output where the vertical distance of total cost and total revenue is maximum and on the other side per unit price can not be found easily.

SHORT RUN EQUILIBRIUM UNDER PERFECT COMPEITION

Short run is the period of time, when a firm can only change variable factors of production. The firm is in equilibrium when it is earning just normal profits.

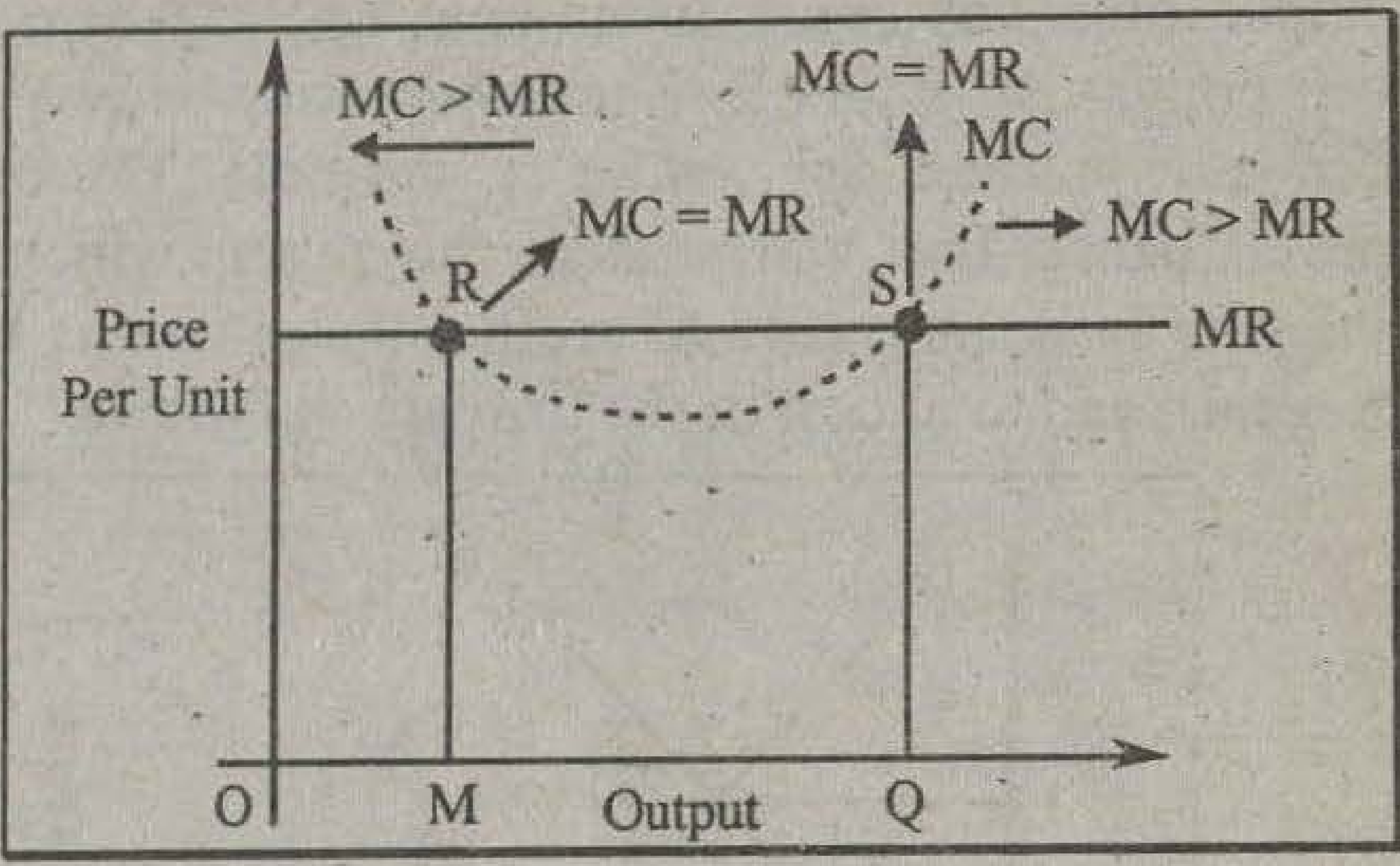
The Optimum Output

Firm's optimum output is at a point where marginal cost is equal to marginal revenue. In perfect competition marginal revenue is always equal to average revenue

because price of each unit sold is the same. In perfect competition none of the firm can influence the price. It can only adjust its output. Hence, MR and AR (i.e., price) curves are parallel to x-axis. Marginal cost curve is the supply curve of the firm and average revenue curve is the demand curve.

Equality of MC and MR

The equality of MC and MR can be explained with the help of a diagram. The equality of MC and MR is necessary but not sufficient, for profit maximization.



In the diagram above there are two levels of output where MC = MR i.e., at OM level of output and at OQ level of output. Towards left of point R, MC is greater than MR and towards right of point S, again MC is greater than MR therefore, a firm will produce towards left of point S and towards right of point R.

If a firm choose production at OM level of output although MC = MR yet total profits cannot be maximum because a firm will be selling a smaller amount of output. At OQ level of output firm's MC is the same as at OM level of output while firm's output is much greater than at OM level of output. As the basic objective of a firm is to maximise profits therefore, a firm will produce at OQ level of output which proves that optimum level of output, maximising profits will be a point when MC = MR and MC cuts MR from its below.

In between R and S although MR is greater than MC but a firm would not produce because there is a tendency for more profits.

Price-output determination under perfect competition in the short period can be explained with the help of a diagram.

In fig. 1 equilibrium price is OP which has been determined through the forces of demand and supply. In fig. 2 units of output have been measured on x-axis and cost and Revenue on y-axis. MR = AR = Price because of perfect competition which shows that none of the firm in perfect competition can change or influence the price. It can only adjust its output according to the prevailing price. A.T.C. curve is the average total cost curve which is U-shaped. The minimum portion of the curve is tangent to the average revenue curve. Each firm in perfect competition will produce at minimum cost and it follows the method or technique of production of the other firms however, if a firm adopts such a method of production that minimise the cost of production other firms will have to follow this technology otherwise they may be out of competition. MC is the

marginal cost curve which is below the ATC curve, when ATC curve is falling. AVC curve is the average variable cost curve which is below the ATC curve but its distance is decreasing but it never intersects ATC curve because the difference between ATC and AVC is of average fixed cost and average fixed starts decreasing with an increase in output. Firm's optimum output is at a point where MC = MR. But MC is equal to MR at two points i.e., R and E hence, there may be two outputs of the firm OM and OQ but a firm can produce one output at one time. The basic aim of the firm being maximum profits hence, firm will produce that output which maximise its profits hence, i.e., when the firm is earning normal profits. If the firm is producing OM of output then the total Revenue and total cost of the firm are as follows:

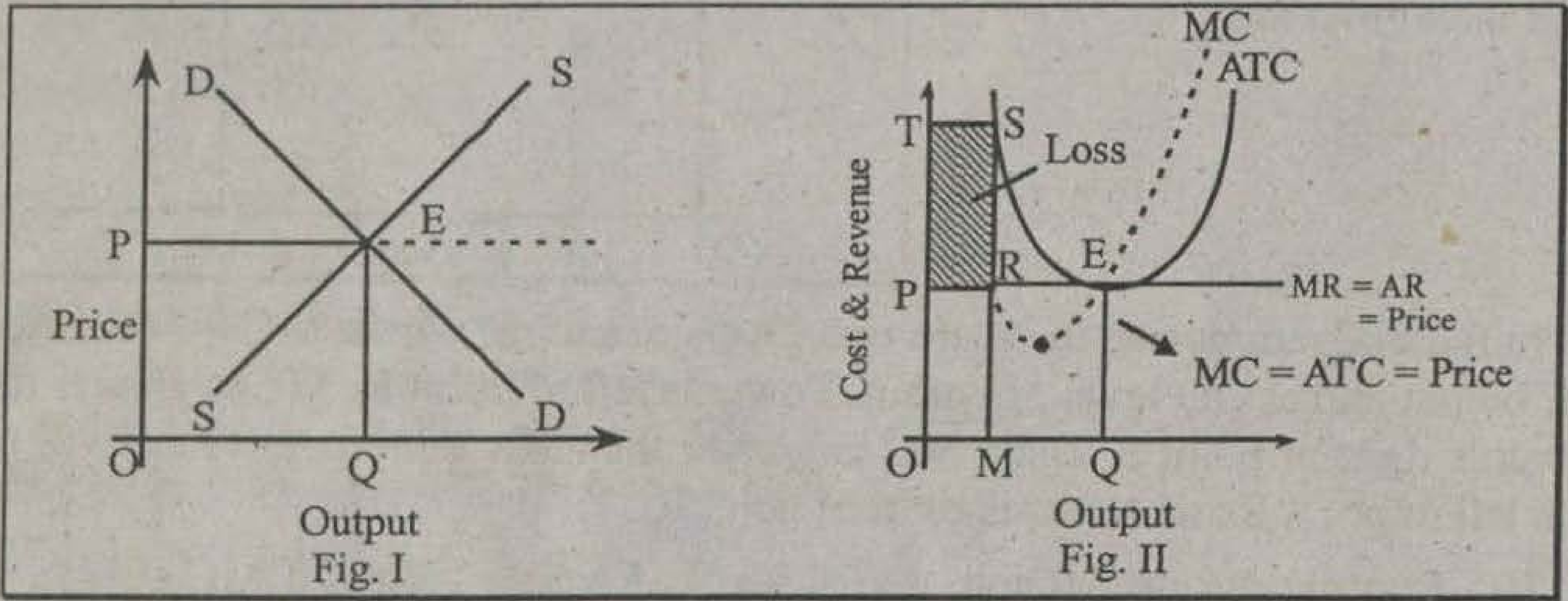


Fig. I

Fig. II

At OM level of Output

Total Cost = Average total cost × Output

Total Cost = MS × OM

Total Cost = OMST

Total Revenue = Average Revenue × Output

Total Revenue = MR × OM

Total Revenue = OMRP

TC > TR

∴ Loss and

Loss = TC – TR

Loss = OMST – OMRP = PRST

Total cost is greater than the total revenue that is firm is facing losses equal to PRST. The basic aim of the firm is to maximise profits therefore, firm will not product OM level of output. If the firm produces OQ level of output then the total revenue and total cost of the firm are as follows:

Total Revenue = Average Revenue × Output

Total Revenue = QE × OQ

Total Revenue = OQEP

Total Cost = Average total cost × Output

Total Cost = QE × OQ

Total Cost = OQEP

Hence, total revenue = Total Cost. So firm is earning normal profits because normal profits are included in the average cost. It is proved that firm in the equilibrium when MC = MR and MC curve cuts MR curve from its below. At that level of output when firm's total cost is equal to total revenue a firm is earning normal profits. At equilibrium level MC = AC = Price also.

The conditions of equilibrium of firm:

(a) Cost of production is same for all firms.

(b) Ability of each entrepreneur is also the same.

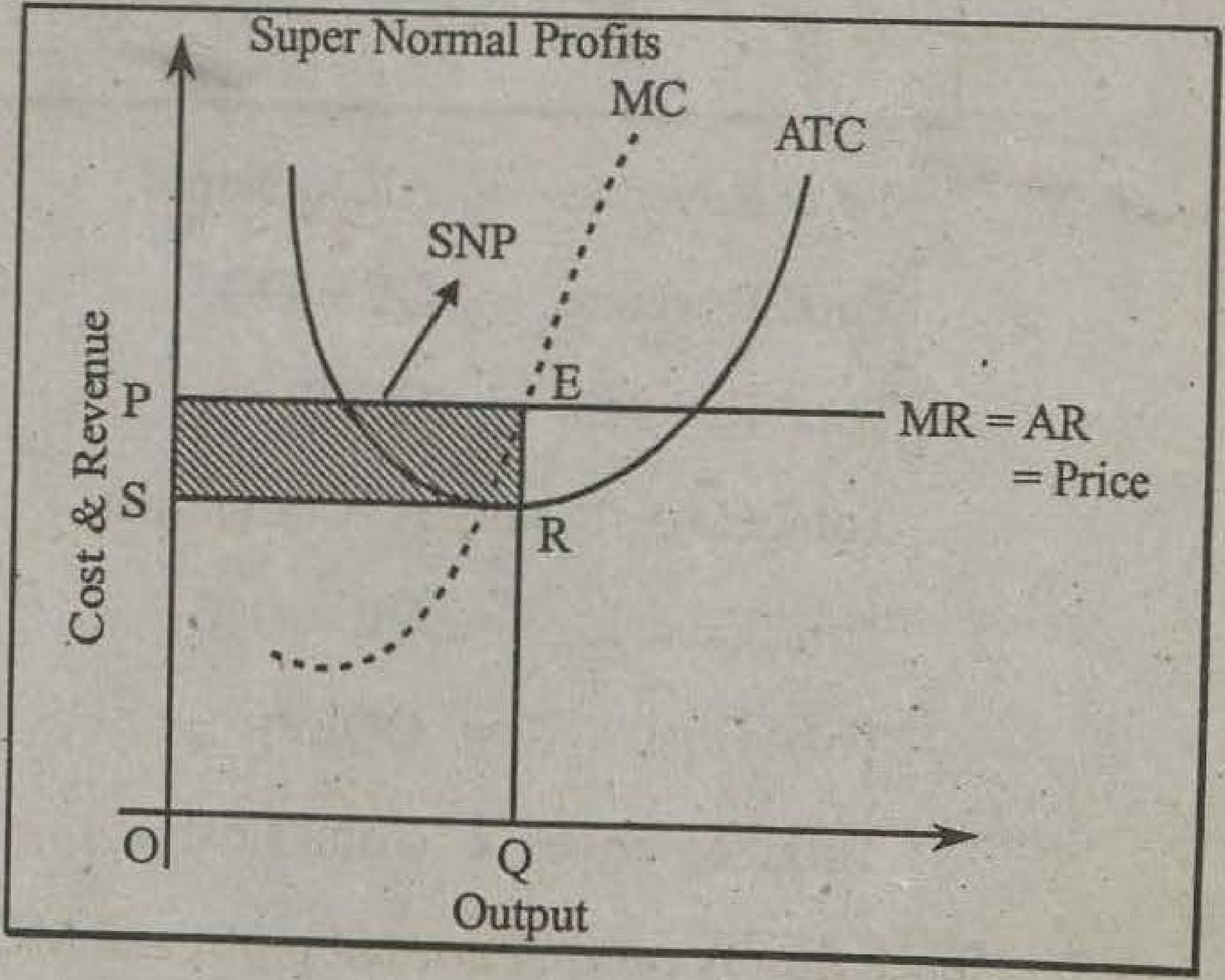
(c) Factors of production which different firms are using are homogeneous and are available at prevailing price.

Alternative short run equilibrium positions for a firm under perfect competition

In short run under perfect competition a firm can earn supper normal profits because firm can only change variable factor of production so if price increases due to increase in demand, firms can increase supply upto some extent as the new firms cannot enter into industry hence, firms in the industry can earn super normal profits, it can be explained with the help of a diagram.

In the diagram MR = AR = P due to perfect competition. Minimum of ATC curve is below the AR curve. MC curve cuts ATC curve from its below and minimum. M C curve cuts MR curve at E. Optimum level of output is OQ.

Total cost and total revenue of the firm are given below:



Total Revenue = AR × Output

Total Revenue = QE × OQ

Total Revenue = OQEP

Total Cost = ATC × Output

Total Cost = QR × OQ

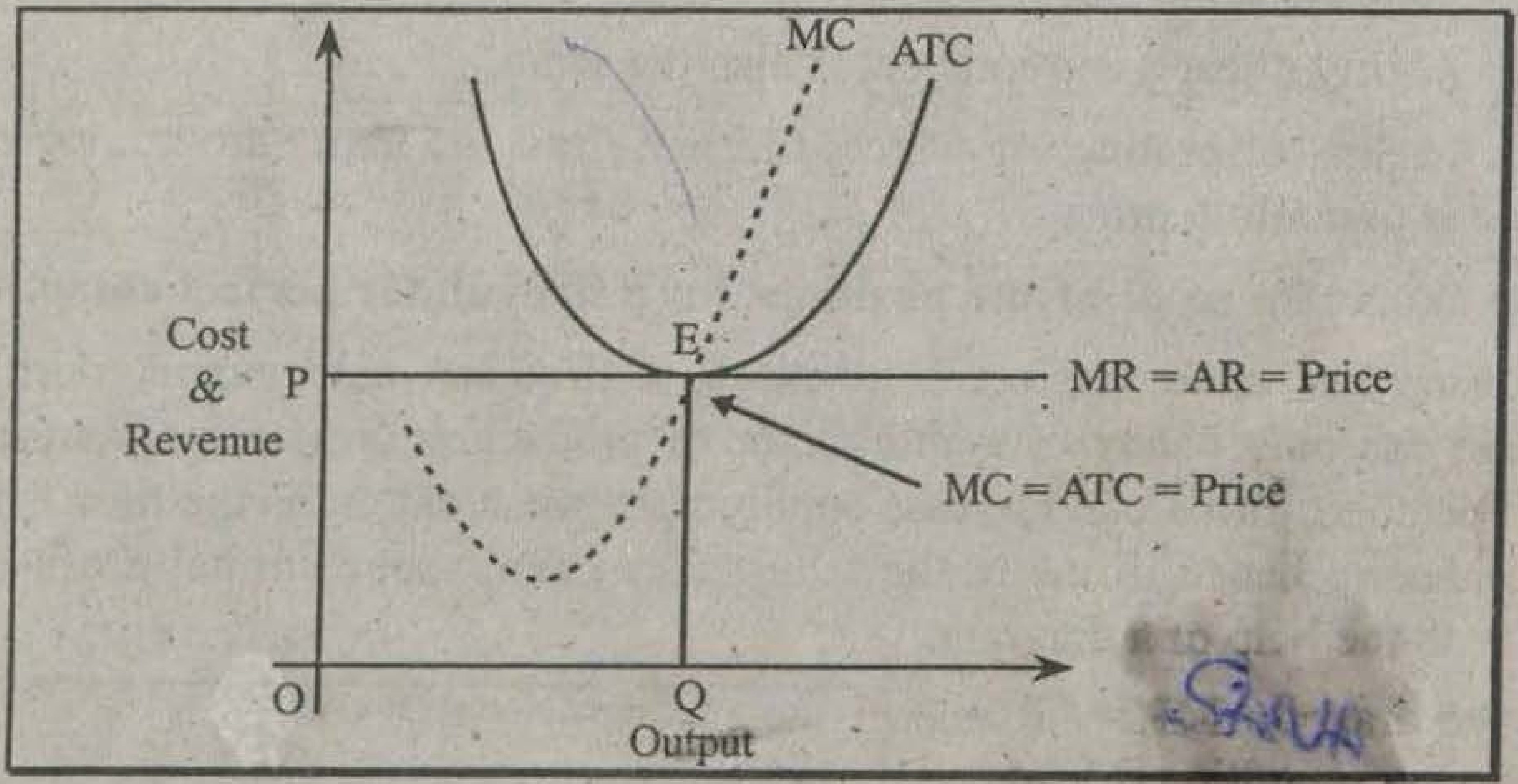
Total Cost = OQRS

Super Normal Profits = TR – TC

Super Normal Profits = OQEP – OQRS

Super Normal Profits = SREP

(b) When Firm is Earning Normal Profits



Total Revenue = AR × Output

Total Revenue = QE × OQ

Total Revenue = OQEP

Total Cost = ATC × Output

Total Cost = QE × OQ

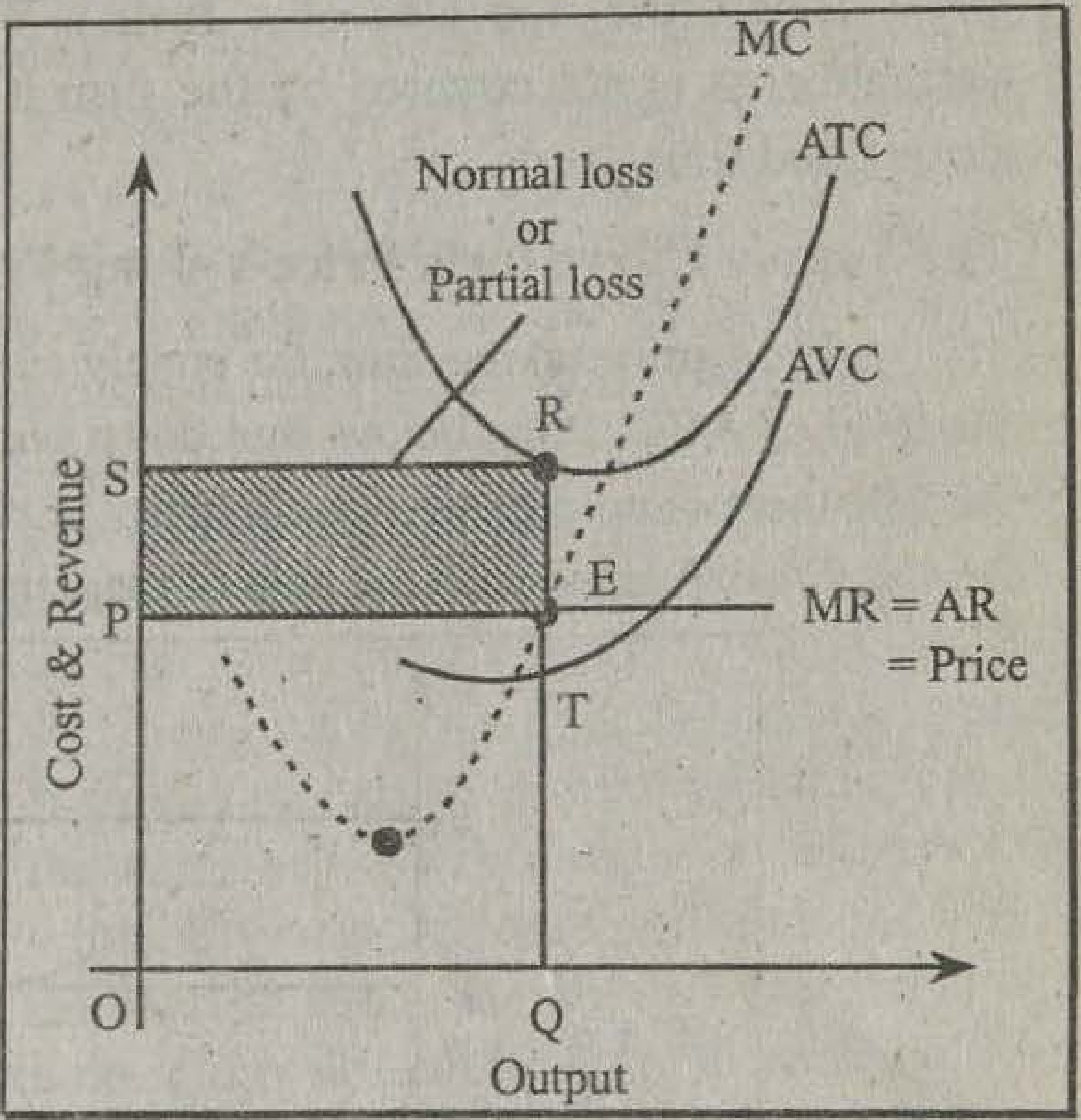
Total Cost = OQEP

Total Revenue = Total Cost

Hence firm is earning normal profit and MC = AC = Price

(c) When Firm is Facing Partial Losses of Fixed Cost (Normal Loss)

In the diagram ATC curve is above the AR curve but Minimum part of AVC curve is below the AR curve. MC curve cuts ATC and AVC curves from their below and minimum points. The optimum level of output is OQ. Total cost and total revenue of the firms are given below:



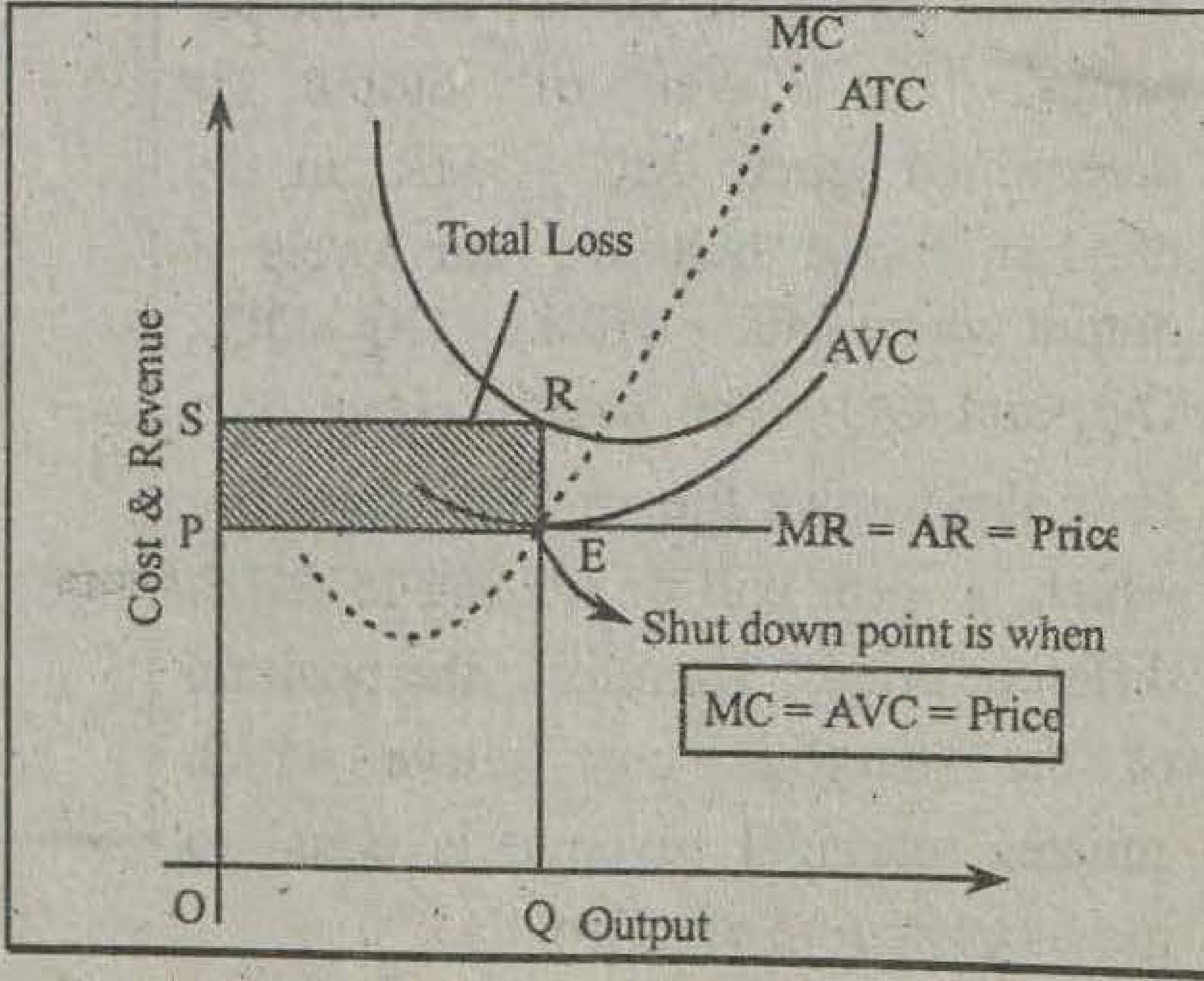
Total Cost = ATC × Output
Total Cost = QR × OQ
Total Cost = OQRS
Total Revenue = AR × Output
Total Revenue = QE × OQ
Total Revenue = OQEP
∴ Loss TC > TR
and Loss = TC – TR
= OQRS – OQEP = PERS

Losses of the firms are equal to PERS. But the firm will continue its production because a portion of the fixed cost is still being achieved by the firm. The difference between ATC and AVC curves is of average fixed cost which is equal to RT at optimum level of output. ER portion of the average fixed cost is the partial loss of AFC. In the short period firms can avoid variable cost losses but cannot avoid fixed cost so a firm goes on operating unless and until it is covering even a small portion of fixed cost. If a firm closes down its business when it was covering a portion of the fixed cost it will has to bear more losses.

(d) Shut Down Point (Total Loss of Fixed Cost)

Shut down point for a firm is a point when a firm closes down its business. It can be explained with the help of a diagram.

In the diagram ATC curve is above the AR curve and AVC curve is tangent with AR curve. The diagram shows that firm is not covering fixed cost, only variable cost is being covered by the firm.



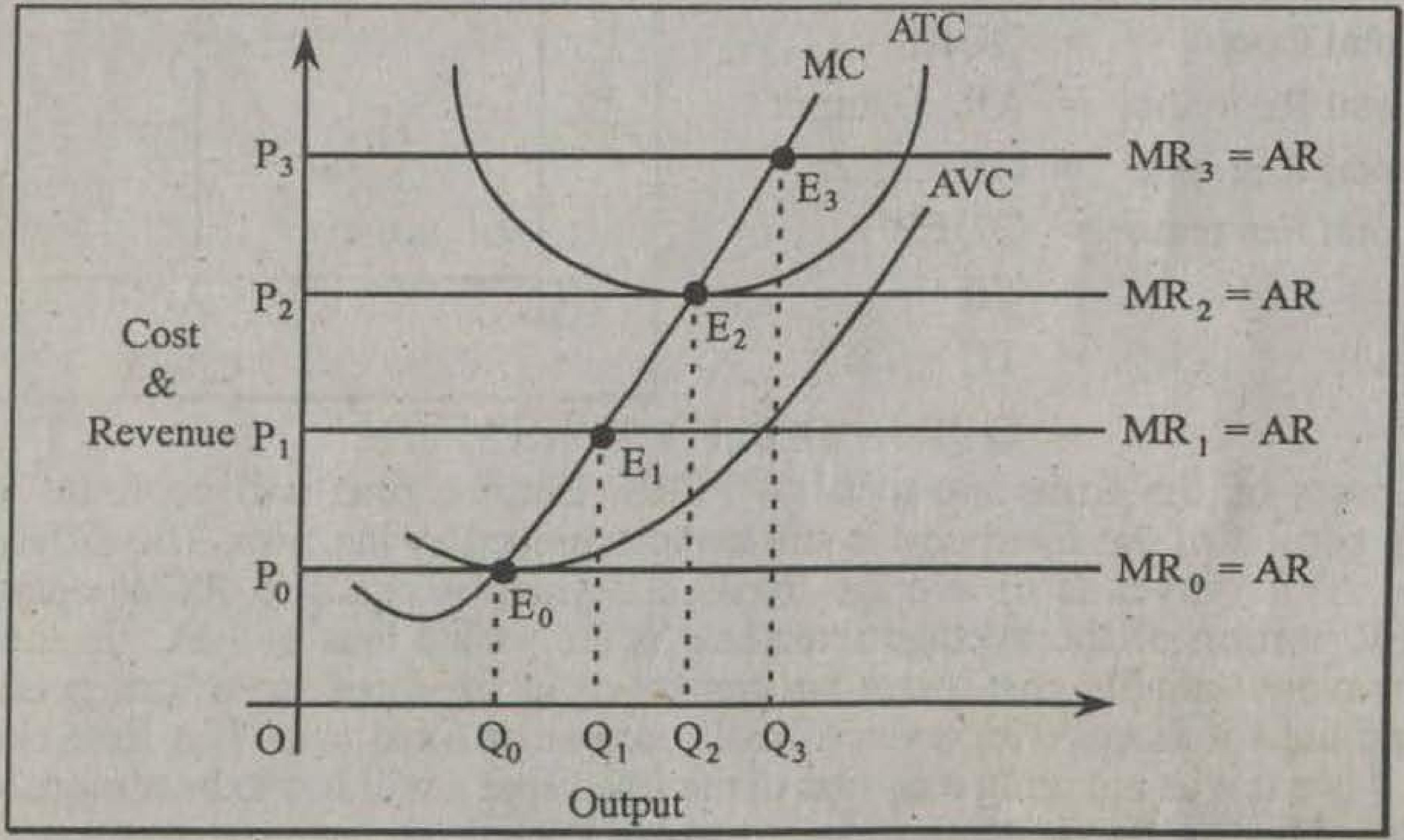
Total cost and total revenue of the firm are given below:

Total Cost = ATC × Output
Total Cost = QR × OQ
Total Cost = OQRS
Total Revenue = AR × Output
Total Revenue = QE × OQ
Total Revenue = OQEP

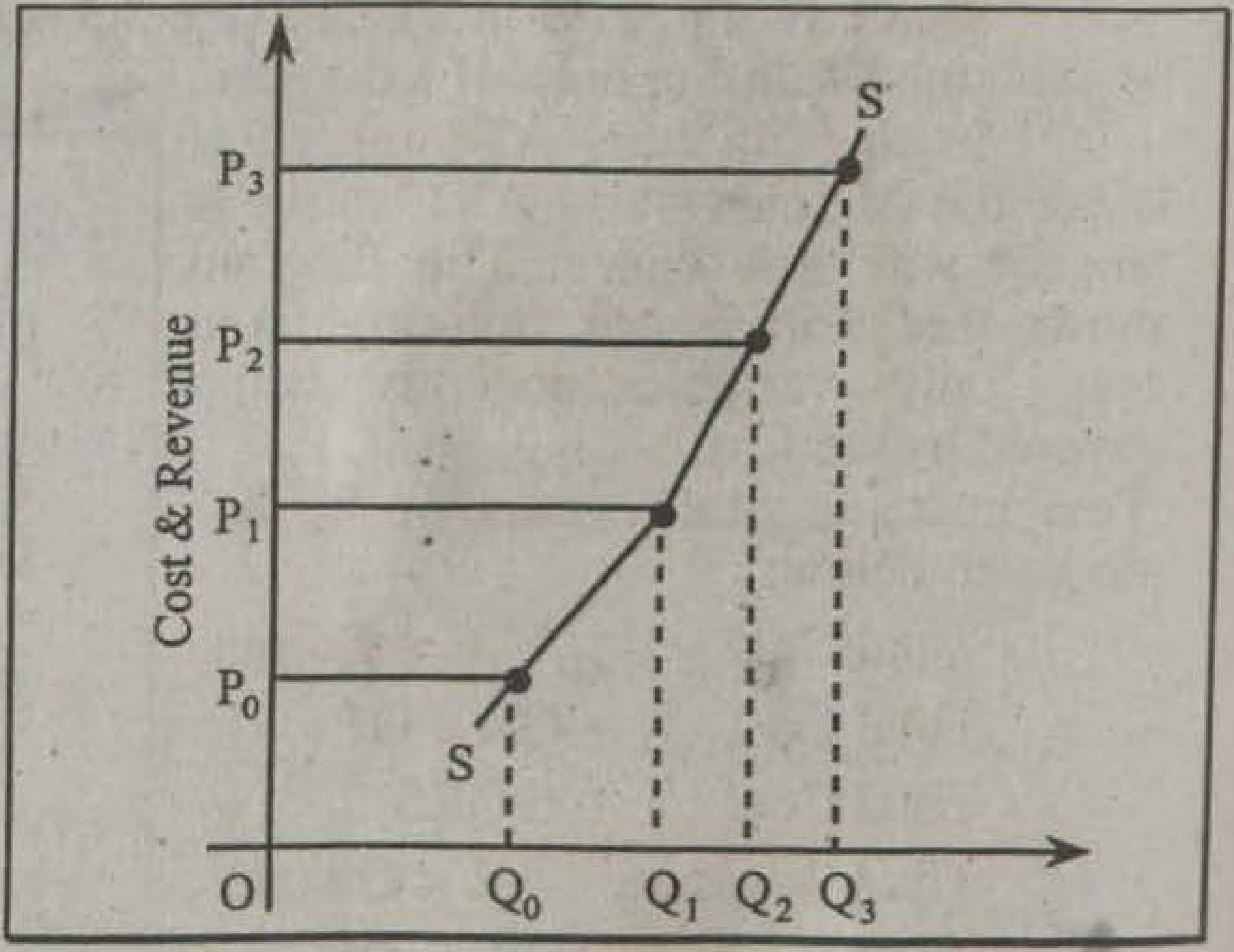
Therefore, the loss of a firm is equal to PERS as shown in the diagram. If a variable cost is not covered by the firm it will close down its business and will wait for some good time.

The Supply Curve for a Price Taking Firm

For a price taking firm, the supply curve has been the same shape, its MC curve is above the level of AVC. Price below shut down point is zero and above the points when MC is above the MR there is no quantity i.e., quantity is zero. Derivation of a supply curve for a price taking firm can be explained with the help of diagrams below.



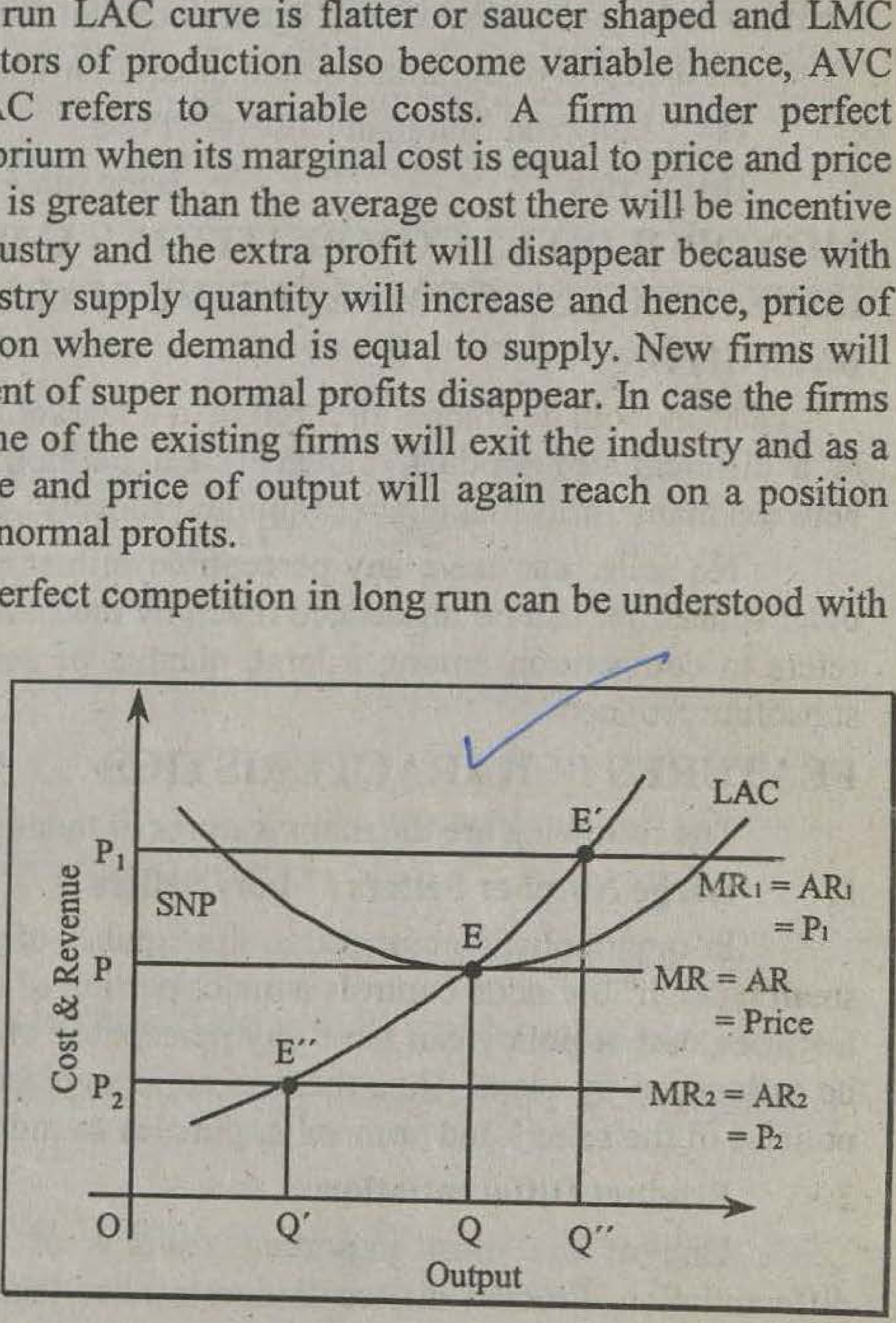
Firm's Marginal Cost shows its different levels of output at different prices. The level of output is determined where MC = MR. In the diagram above there are four levels of output where MC = MR i.e., OQ_0, OQ_1, OQ_2 and OQ_3. The supply curve of a firm also shows the various quantities which a firm will be willing to sell at different prices. Therefore, the position of the marginal cost curve which equates marginal revenue is equal to the supply curve of a firm.



LONG-RUN EQUILIBRIUM

Long run is a period of time when a firm can change not only variable factors of production but also fixed factors of production. In short period a firm can increase its output by changing the variable factors of production and new firms can not enter into the industry hence a firm in short period can earn super normal profits, can face losses and great losses (i.e., shut down) but in the long run a firm can generally earn normal profits. If firms in the industry are earning super normal profits. If new firms will enter into the industry the element of super normal profits will disappear. In the long run firm can increase its output by changing the size of the plant it can replace new plant with that of old one. In the short period ATC curve is U-shaped and MC curve is more steeper and there is also AVC curve. In long run LAC curve is flatter or saucer shaped and LMC curve is less steeper. As fixed factors of production also become variable hence, AVC curve is not drawn because LAC refers to variable costs. A firm under perfect competition in long run is in equilibrium when its marginal cost is equal to price and price must equal to average cost. If price is greater than the average cost there will be incentive for the new firms to enter into industry and the extra profit will disappear because with the entry of new firms in the industry supply quantity will increase and hence, price of output will again reach on a position where demand is equal to supply. New firms will enter into industry unless the element of super normal profits disappear. In case the firms in industry are incurring losses some of the existing firms will exit the industry and as a result supply quantity will decrease and price of output will again reach on a position where firms in industry are earning normal profits.

Equilibrium of firm under perfect competition in long run can be understood with the help of a diagram.



In the diagram LAC is the long run average cost curve. MR = AR = Price. When LAC curve is falling LMC curve is below it. When LAC curve is neither falling nor rising LMC curve cuts it from its below when LAC curve is increasing LMC curve is above the LAC curve. LAC curve is tangent with AR curve. Optimum level of output of the firm is OQ. The equilibrium price is OP. At price OP firm's total cost and total revenue are as under:

Total Cost = LAC × Output

Total Cost = QE × OQ

Total Cost = OQEP

Total Revenue = AR × Output

Total Revenue = QE × OQ

Total Revenue = OQEP

Therefore, Total Cost = Total Revenue and firm in the long run is earning normal profits.

If the price is OP_1, the firm is earning super normal profits hence there is incentive for firms to change the size of the plant or to replace new and heavy plant with the old one. The supply will increase until the element of extra profit disappears and price reaches again at OP. If the price is OP_2, the firm in industry is incurring losses some of the firms in long run will exit and again price will rise and firms will earn normal profits.

At the level of optimum output or equilibrium two conditions are being satisfied:

(a) Long run Marginal Cost = Price

(b) Price = Long run Average Cost

MONOPOLISTIC COMPETITION / IMPERFECT COMPETITION / IMPERFECTLY COMPETETIVE MARKET

DEFINIITON

Monopolistic competition refers to a market situation where there are many sellers of a differentiated product. "There is competition which is keen, though not perfect, between many firms making very similar products".

No seller can have any perceptible influence on the price output policies of the other sellers nor can be influenced much by their actions. Thus monopolistic competition refers to competition among a large number of sellers producing close but not perfect substitute products.

FEATURES / CHARACTERISTICS

The following are the main features of monopolistic competition:

1. Large Number Sellers / Many Sellers

In monopolistic competition the number of sellers are large. They are "many and small enough" but none controls a major portion of the total output. No seller by changing his price output policy can have any perceptible effect on the sales of others and in turn be influenced by them. Thus there is no recognized interdependence of the price output policies of the sellers and each seller pursues an independent course of action.

2. Product Differentiation

One of the most important features of monopolistic competition is product differentiation. Product differentiation implies that products are different in some ways from each other. They are similar rather than homogeneous. There is, however, slight difference between one product and others in the same category. Product differentiation may be based on production and distribution techniques, trade marks, patent rights etc.

3. Freedom of Entry and Exit of Firms

Another feature of monopolistic competition is the freedom of entry and exit of firms.

4. Nature of Demand Curve

Under monopolistic competition no single firm controls more than a small portion of the total output of a product. No doubts there is an element of differentiation, never the less the product are close substitutes. As a result, a reduction in price will enable a firm to increase its sales by attracting some customers of its competitors, provided the latter does not reduce their prices. Similarly, by raising its price it will be losing many of its customers to its rival firms. A reduction in its price will not double increase the sale of the firm but it will have little effect on the price output conditions of other firms, each will lose only a few of its customers.

Therefore, the demand curve (average revenue curve) of a firm under monopolistic competition slopes downward to the right. It is highly elastic but not perfectly elastic.

PRICE OUTPUT DETERMINATION OF A FIRM IN MONOPOLISTIC COMPETITION

Short-Run Equilibrium

The short run analysis of the firm under monopolistic competition is based on the following assumptions:

1. That the number of sellers is large and they act independently of each other. Each one is monopolist in his own sphere.
2. That the product of each seller is differentiated from the other's products.
3. That the firm has determinate demand curve (AR) which is elastic.
4. That the factor services are in perfectly elastic supply for the production of the product in question.
5. That the short-run cost curves of each firm are different from the others; and
6. No new firms enter the industry.

Given these assumptions, each firm fixes such price and output which maximises its profits. The equilibrium price and output is determined at a point where the short run marginal cost equals marginal revenue.

Since costs differ in the short run, a firm with lower unit costs will be earning only normal profits. In case it is able to cover just the average variable cost, it incurs losses.

In figure (1) the short run marginal cost curve (SMC) cuts the marginal revenue curve at E. This equilibrium point establishes the Price (OP), and output OQ. As a result, the firm earns super normal profits represented by the area SRAP.

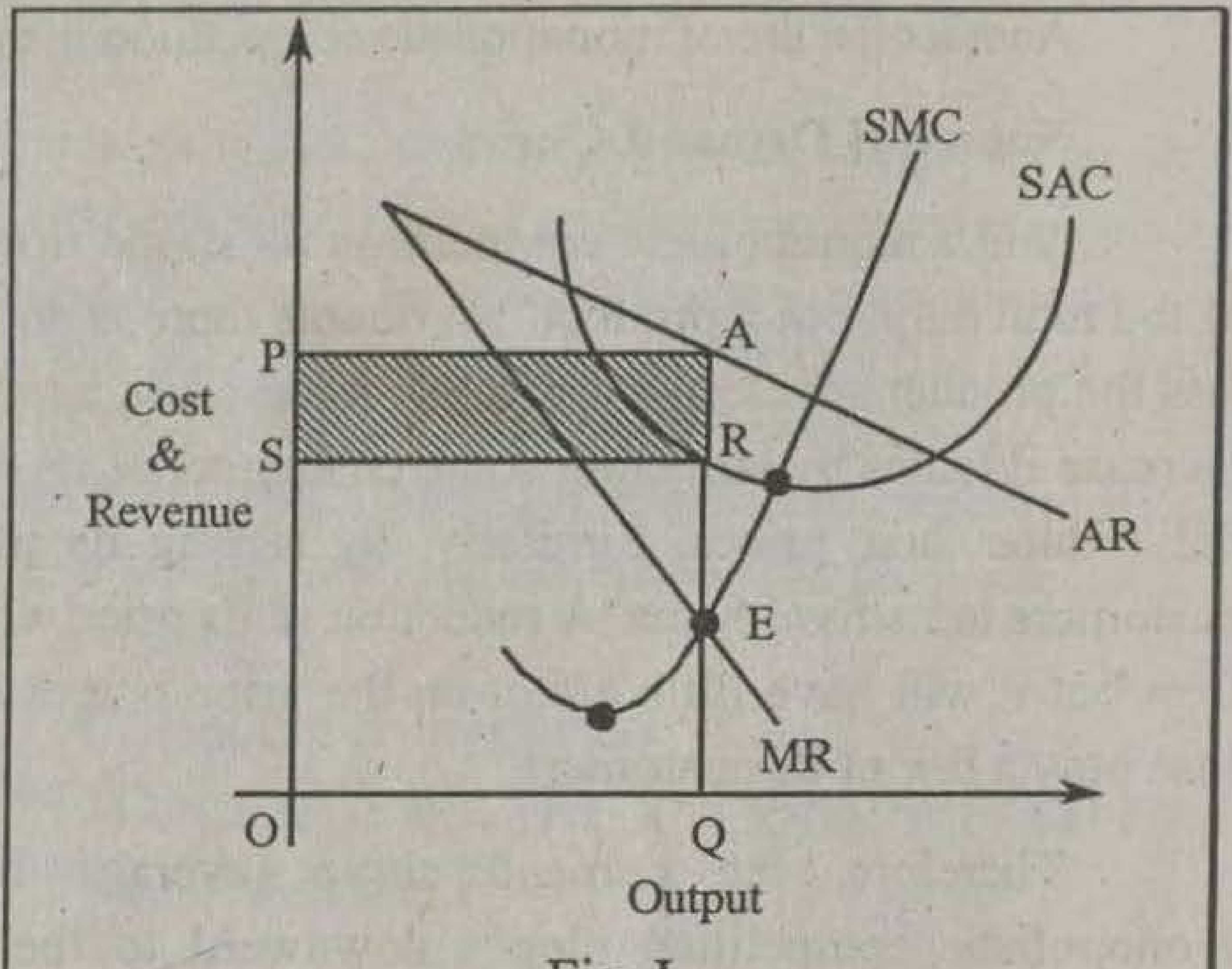


Fig. I

Figure (2) indicates the same equilibrium point price and output. But in the case the firm just covers its short run average unit cost as represented by the tangency of demand curve. (D) and the short run average unit cost curve (SAC) at A, it shows normal profits.

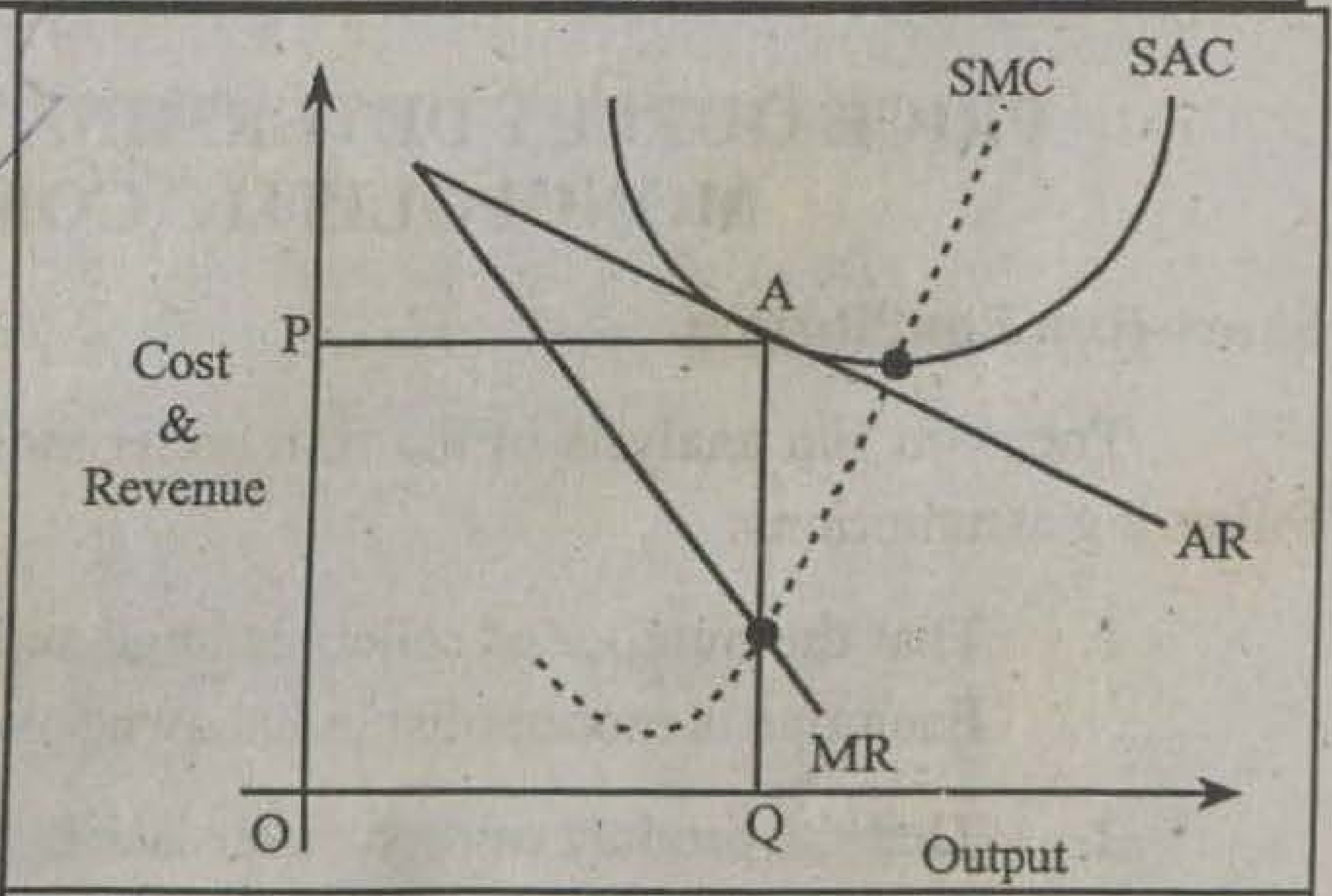
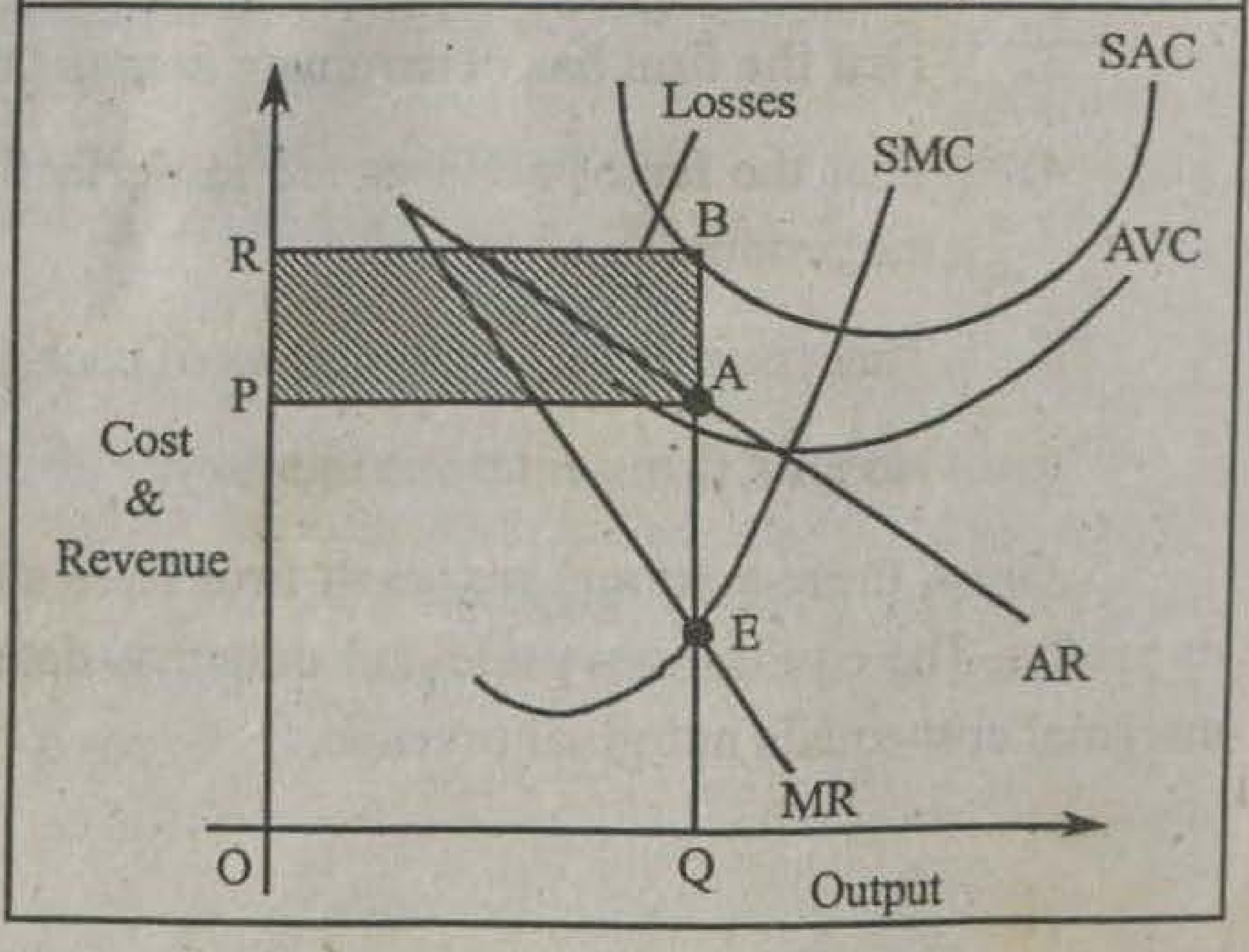


Figure (3) shows a situation where the firm is not able to cover its short run average unit cost and therefore incurs losses.

Price set by equality of SMC and MR curves is QA which covers only the average variable cost. The tangency of the demand curve (D) and the average variable cost curve. If the firm lowers the price below QA, it will have to stop further production. However, at this price the firm will incur losses equal to the area PABR during the short run in the hope of lowering its costs in the long run.



It is not essential that during the short run all firms charge identical price and produce the same quantity, as we have shown above.

1. When a firm earns super normal profits. (Fig. 1)

Total Cost = ATC × Output

Total Cost = QR × OQ

Total Cost = OQRS

Total Revenue = Average Revenue × Output

TR = QA × OQ

TR = OQAP

Total Revenue > Total Cost

Super normal profits = Total Revenue – Total Cost

SNP = OQAP – OQRS

SNP = SRAP

2. When a firm is earning normal profit (Fig. B)

TC = ATC × Output

TC = QA × OQ

TC = OQAP

TR = QA × OQ

TR = OQAP

TR = TC

OQAP = OQAP

Normal Profits.

3. When a firm is facing losses (Fig. C)

TC = ATC × Output

TC = QB × OQ

TC = OQBR

TR = AR × Output

TR = QA × OQ

TR = OQAP

Losses = TC – TR

Losses = OQBR – OQAP

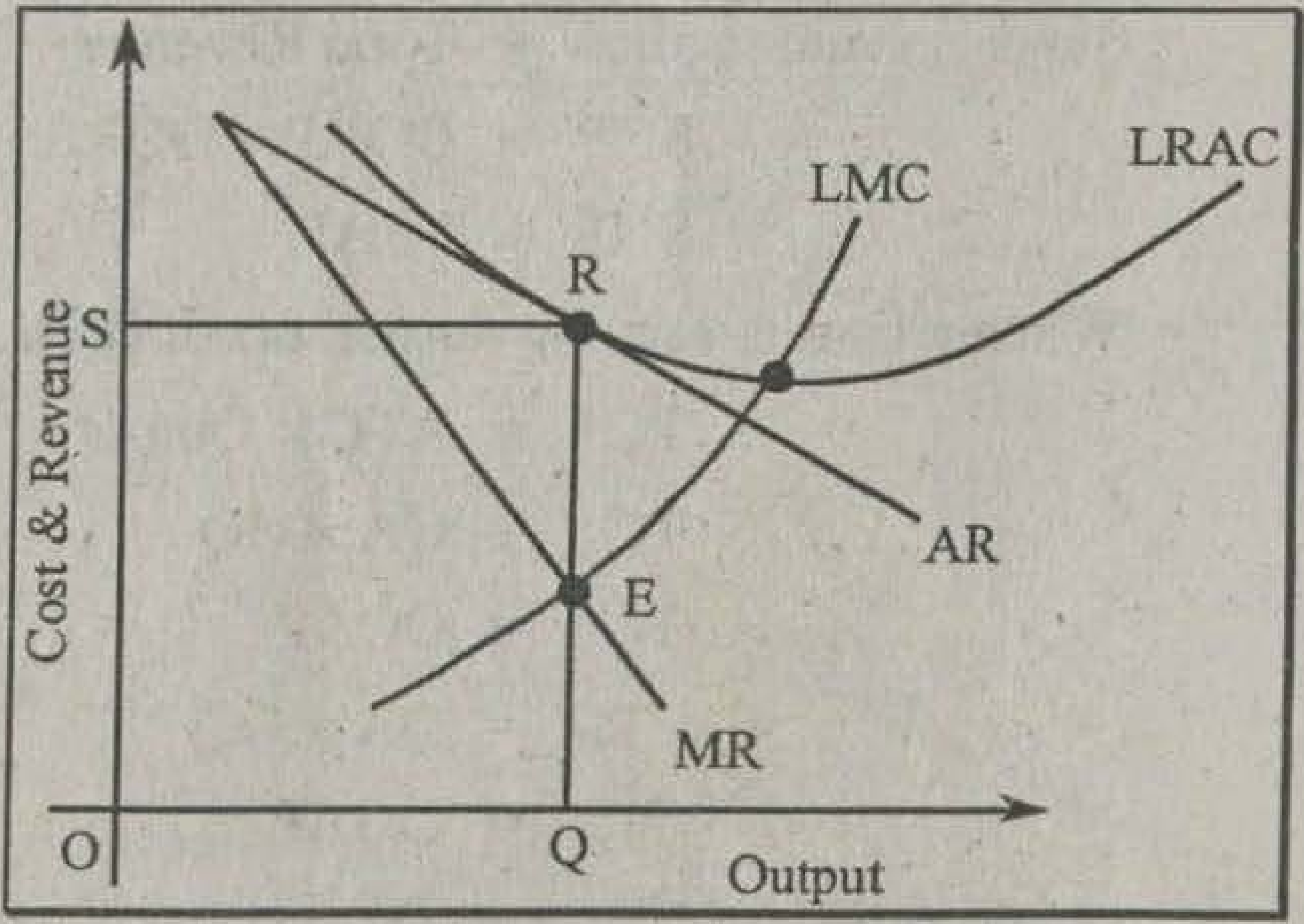
Losses = PABR

Each firm acts in accordance with its own short run costs and equates its SMC curve the MR curve. However, this does not mean that the firm fixes a very divergent price from the other producers. Since its product has close substitutes, its price will have to approximate to the prices of the other firms producing similar product.

Long-Run Equilibrium

Assuming entry and exist of firms in a monopolistic competitive industry as under pure competition, the adjustment process will ultimately lead to the existence of only normal profits. This is a realistic assumption for the long run, no firm can earn either super normal profits or incur losses, since each firm produces a similar product.

Each firm will be earning only normal profits in the long run. The situation is represented in the Figure given below:



LAC is the long run average cost curve which is tangent to AR (price) curve when LAC is falling LMC (is the long run marginal cost curve) cuts LAC from its below and minimum. Optimum level of output is OQ determined by the equality of LMC and MR when LMC cuts MR curve from its below. In the long run total cost becomes variable therefore, in the long run LAC shows total variable cost. It is clear from the diagram.

Total Cost = LAC × Output

Total Cost = OQ × QR

Total Cost = OQRS

Total Revenue = AR (price) × Output

Total Revenue = QR × OQ

Total Revenue = OQRS

Total Revenue = Total Cost

OQRS = OQRS

∴ Normal profits & equilibrium of imperfectly competitive firm.

If firms in the monopolistic competitive industry are earning super normal profits, new firms will be attracted into the group. With the entry of new firms, the existing market is divided among more sellers so that each firm will sell less quantities of the product.

If firms cannot earn extra profits in monopolistic competition losing firms will exit the industry. Supply will be reduced and price will go up. On the other side, resources will become cheaper. Costs will fall. Ultimately, a rise in price and reduction in costs will eliminate losses, the final situation will be as shown in figure where each firm and the industry as a whole will be in long run equilibrium.

MONOPOLY

In ordinary language by monopoly we mean a situation of market where single seller is producing a major portion of the product being produced or sold OR the monopoly is that market form in which a single producer or seller controls the whole supply of a single commodity which has no close substitutes.

Monopoly may be defined as a condition of market where there is only one seller or producer and there are no close substitutes of the commodity which is being sold or produced by the monopolist and there are barriers to new entry.

Three points to be remembered:

(a) That there must be **single seller** or producer. The single seller or producer may be an individual, group of partners, corporation or the state.

(b) There are **no close substitutes**. That there are no other individuals/firms which are selling or producing the similar product or products.

(c) There must be **barrier's for new entry**. Monopoly market can exist only when there are strong barriers for new entry. The barriers may be economic or institunal i.e., artificial. By economic barriers we mean that the consumers are best served by a single firm and it is not profitable for other firms to sell or produce at the same price. The total market is not being enough to permit even one more firms to operate at the optional scale of production. The artificial barriers may be of three types:

   (i) A firm may be enjoying the exclusive control or ownership of raw material which is necessary to produce the similar product or products.

   (ii) A firm may be enjoying the patent rights.

   (iii) Entry of new firms may be blocked by decreasing the price of product lowering than the cost of production.

TYPES OF MONOPOLY

1. Natural Monopoly

When climatic conditions of an area or a country are favourable for production of a commodity or nature has gifted an area or a country with some minerals it is called natural monopoly.

2. Legal Monopoly

If a firm or an institution is allowed to produce or supply or produce commodity/service it is called legal monopoly.

3. Social Monopoly

When for the welfare of the people, **the rights of producing or selling of a commodity or** providing services are given to an institution, it is called social monopoly.

4. Implied Monopoly

When the **entry of new firms is blocked by a single firm** or group of firms or **the rivals are eliminated** by **aggressive cut throat tactics**, it is called implied monopoly.

ADVANTAGES AND DISADVANTAGES OF MONOPOLY/ARGUMENTS IN FAVOUR OF MONOPOLY AND ARGUMENT AGAINST MONOPOLY

ADVANTAGE

1. Internal and External Economies

The monopolist avoid entry of new firms produces larger quantity i.e., on large scale and reaps the economies of large scale as a result **cost of production decreases and revenue increases.**

2. Research and Experiment

As the financial position of a monopolist **is strong enough he can innovate his product and can improve the quality of its product** through research and experiment. New **discovery** of technique of production may decrease the cost of production and can enjoy higher profits in the long run.

3. Stable Price

Price fluctuations disturb the consumers, but in monopoly the **prices are fixed** by the monopolists hence, there are no frequent changes in the prices.

4. By Products

Due to strong financial position, monopolist can make **best use of its waste** and can produce by products.

5. Advertisement

In monopoly there are barriers for new entry and in the absence of competitors he needs not to spend heavy amounts on advertisement. Cost of production decreases and he can charge less price.

ARGUMENTS AGAINST MONOPOLY LOSSES OF MONOPOY

1. Higher Price

The monopolist supplies major portion of total supply at higher price as he has no fear of competitors and there are no close substitute of its product that is why he charges higher price of its product.

2. Obstacle in Economic Development

Monopolist tries that none of other firms producing the similar product should enter in the business and when he smells that competitors are trying to enter into business he temporarily lowers price below the cost of production and hence country cannot benefit from the services of able minded entrepreneurs.

3. Unequal Distribution of Wealth

With the creation of monopolies wealth concentrates in few hands while majority of the people becomes poor and society is divided into two groups rich and poor and as a result social evils like theft, robbery etc., appear in the society.

4. Misallocation of Resources Allocative Inefficiency

In order to maximise profits monopolist restricts output and charges higher price. The monopolist does not use resources at their peak potential efficiency. The basic aim of the enterprenuer is to maximise profits. The price of output is greater than the marginal cost. His aim is not the welfare of a society.

5. Decrease in Rewards of Factors of Production

In monopoly, services of factors of production are employed by monopolists. They offer low rewards to factors of production and when monopolist restricts output, the complementary factors of production seek employment else where their marginal productivity is certainly low and as a result the price of factors of production will be low.

PRICE OUTPUT DETERMINATION UNDER MONOPOLY

Price-output and profits determination analysis under monopoly is based on the following assumptions:

(i) It is a simple monoply which has a very low cross elasticity of demand with other products.

(ii) The basic aim of monoplist is to maximise profits and minimising costs.

(iii) Either monopoly firm produces in the short period or in the long period the objective of maximum profits does not change.

(iv) Perfect competition exists on the demand side on the part of the buyers so that none of the buyer can influence the price of the product.

(v) Under normal condition, monopolist charges uniform price.

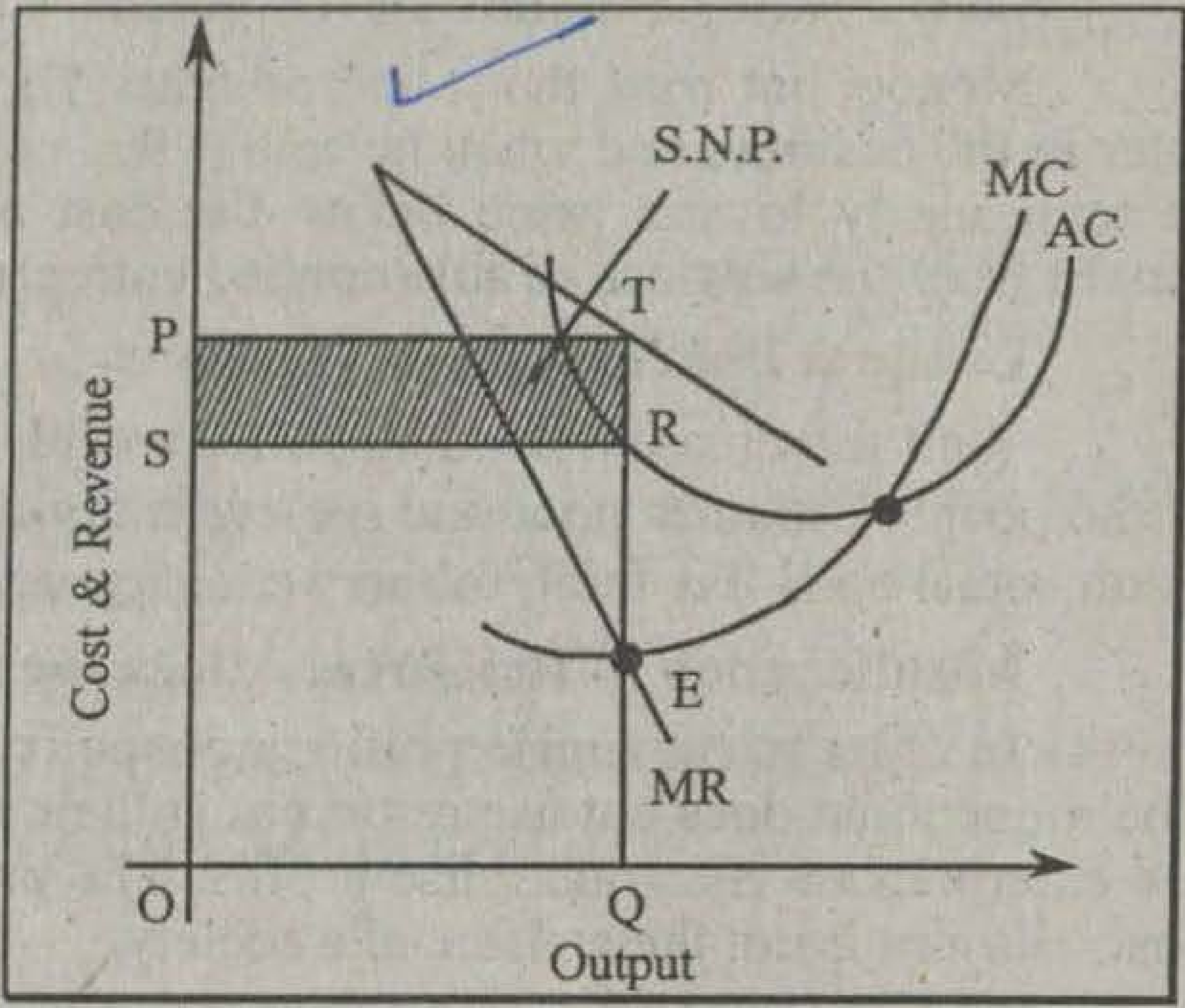
(vi) The monopoly price is uncontrolled, there is no threat of entry of other firms into his market.

SHORT PERIOD PRICE DETERMINE

If monopoly marginal revenue and average revenue curves slope downward average revenue curve remains above the marginal revenue curve because A.R. slopes at slower rate than MR. AR curve is also the demand curve of the monopoly firm. As monopolist supplies major portion of total supply so firm is also industry. Short run and long run do not matter because monopolist in both the periods charges same price, cost of production generally remains same. Price output determination under monopoly is explained with the help of a diagram.

Normal Conditions (Profit Maximising Monopoly)

Output has been measured on x-axis. AR and MR are the average and marginal revenue. ATC is the average total cost curve. MC is the marginal cost curve which intersects MR curve from its below at point E and it also intersects ATC curve from its below. Total cost and total revenue of the firm are given below:



Total Cost = ATC × Output

Total Cost = QR × OQ

Total Cost = OQRS

Total Revenue = AR × Output

Total Revenue = QT × OQ

Total Revenue = OQTP

Hence, super normal profits of the monopolist are equal to SRTP.

Extra-ordinary cases for monopoly in the short period.

(a) A monopoly Firm Facing Losses (Windfall Loses)

Total Cost = AC × Output

Total Cost = QS × OQ

Total Cost = OQST

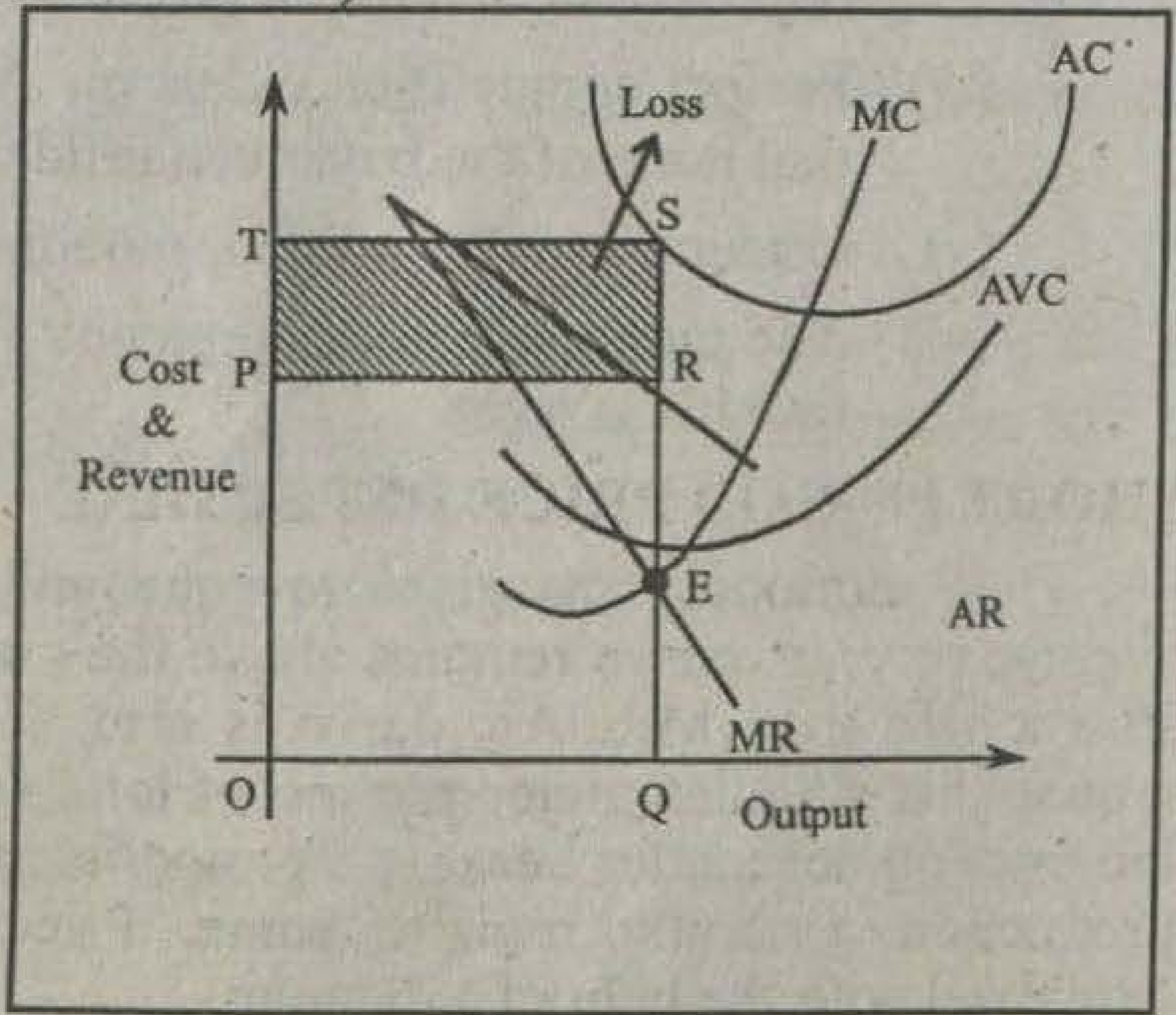
Total Revenue = AR (price) × Output

Total Revenue = QR × OQ

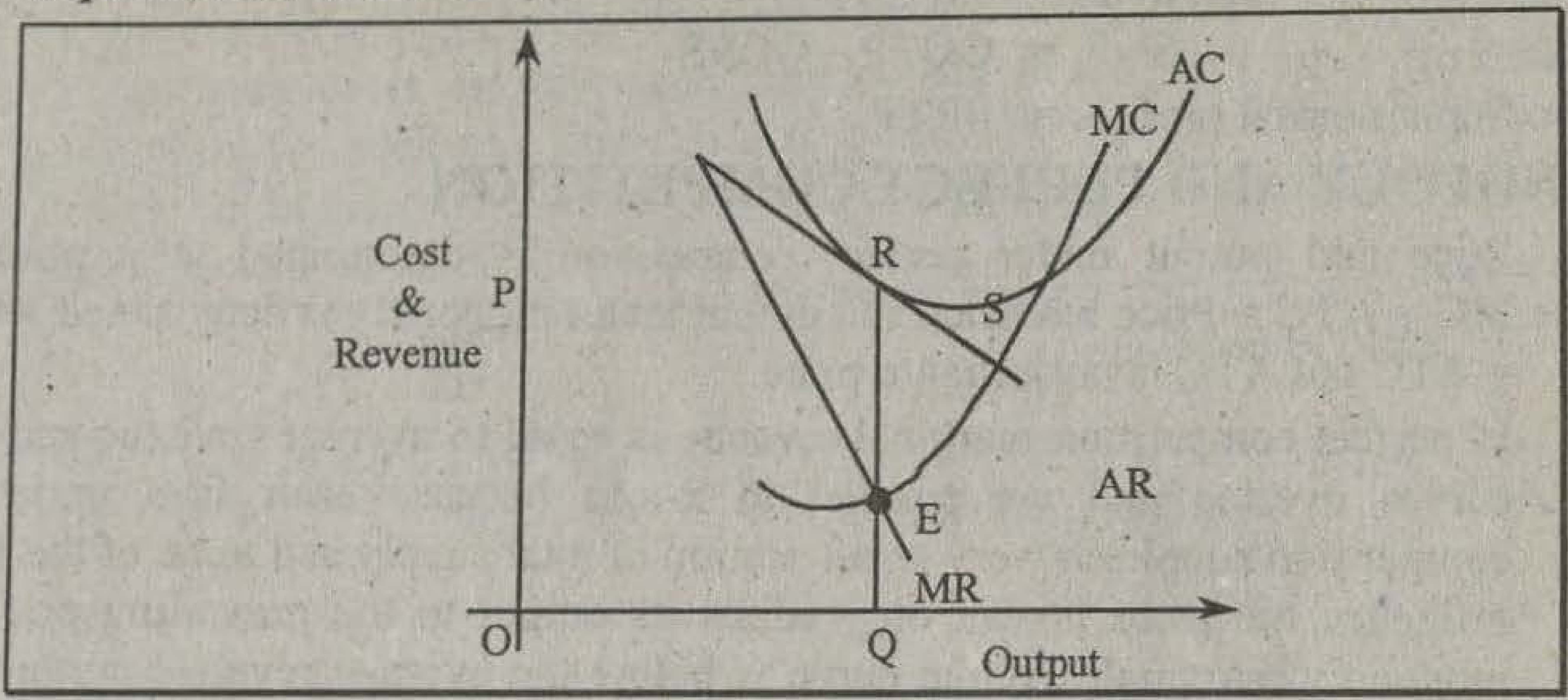
Total Revenue = OQRP

TC > TR

∴ Loss.



(b) Equilibrium of Firm



Total Cost = AC × Output

Total Cost = QR × OQ

Total Cost = OQRP

Tota' Revenue = AR × Output

Total Revenue = QR × OQ

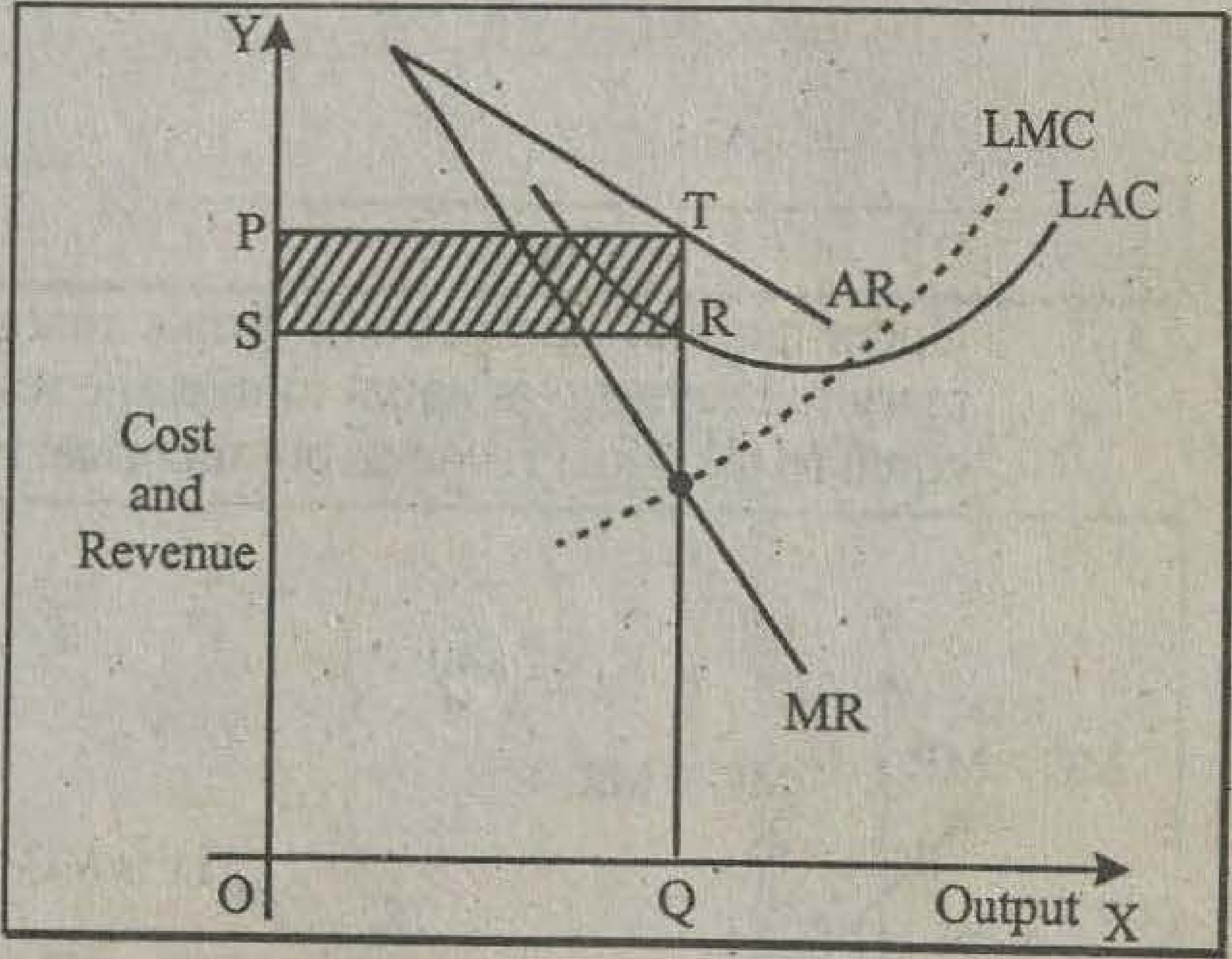
Total Revenue = OQRP

TC = TR.

i.e., Equilibrium.

Long Period Price Determination

In the short run equilibrium, profits are maximum when MC = MR, price is higher and total cost is less than total revenue. In the long run he changes the size of his plant in order to earn super normal profits as explained below:



In the diagram above

Total Cost = LAC × Output

Total Cost = QR × OQ

Total Cost = OQRS

Total Revenue = AR (price) × Output

Total Revenue = QT × OQ

Total Revenue = OQTP

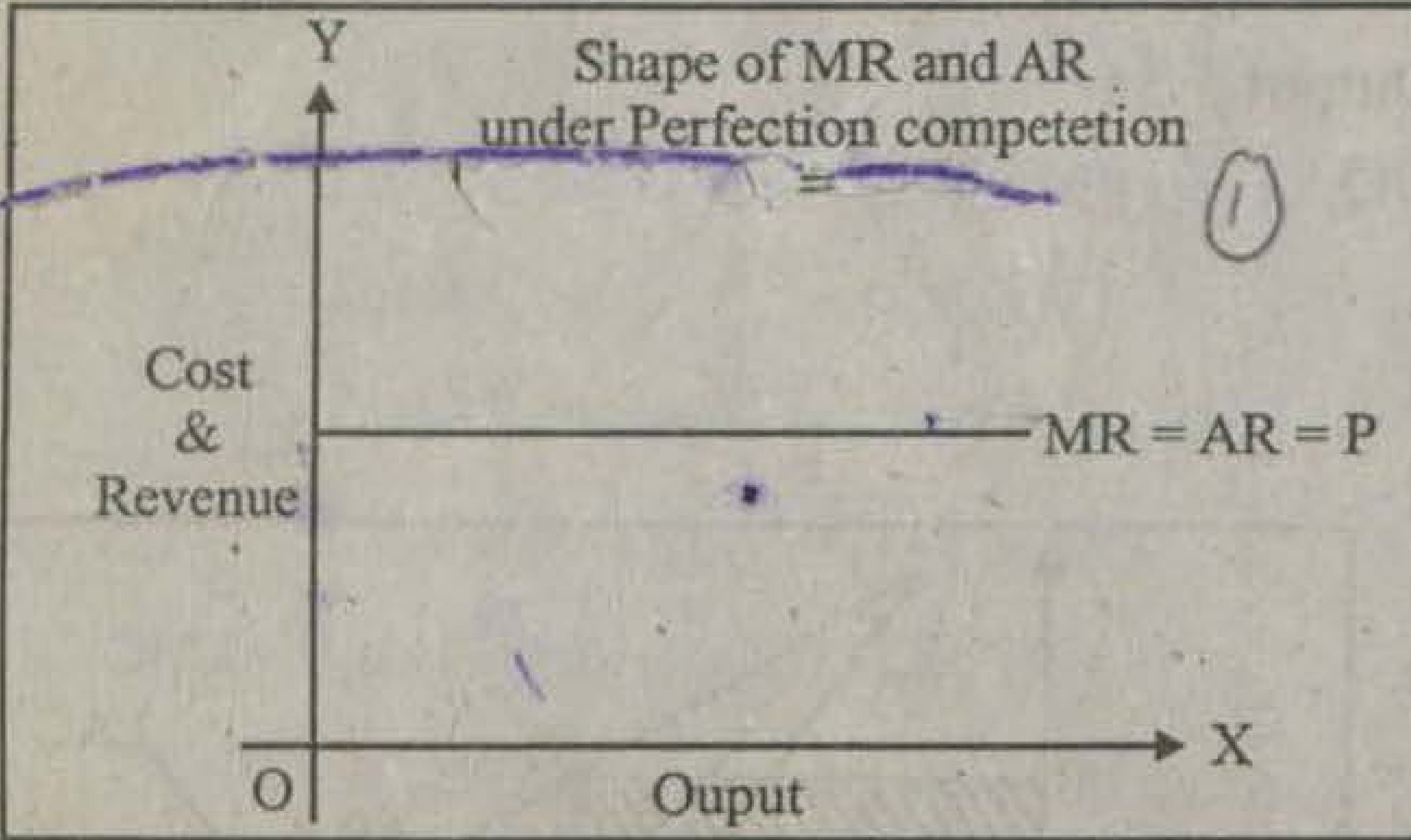
Total Revenue > Total Cost

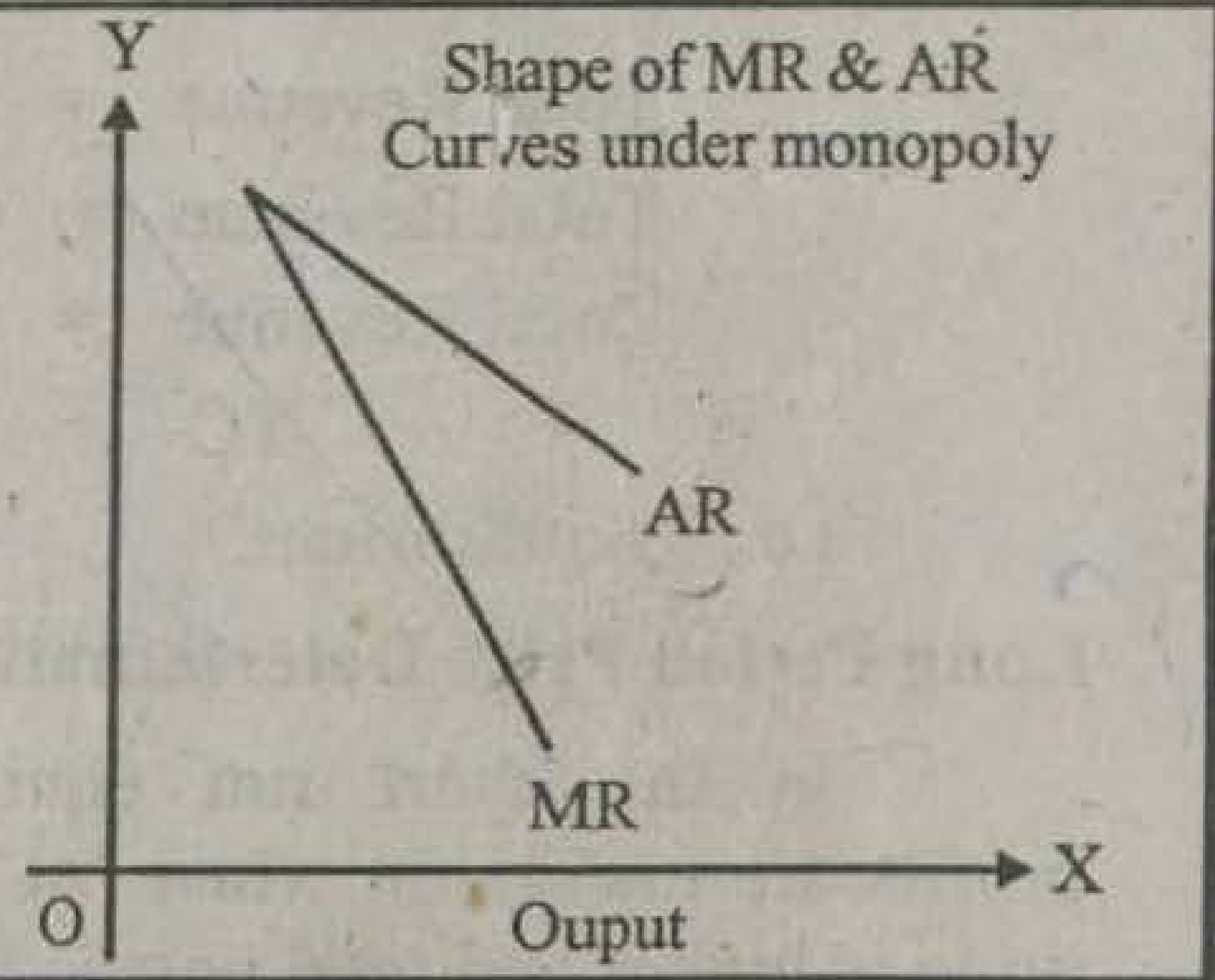
Therefore super normal profits and

$$SNP = TR - TC$$
$$SNP = OQTP - OQRS$$
$$\text{Super normal profits} = SRTP$$

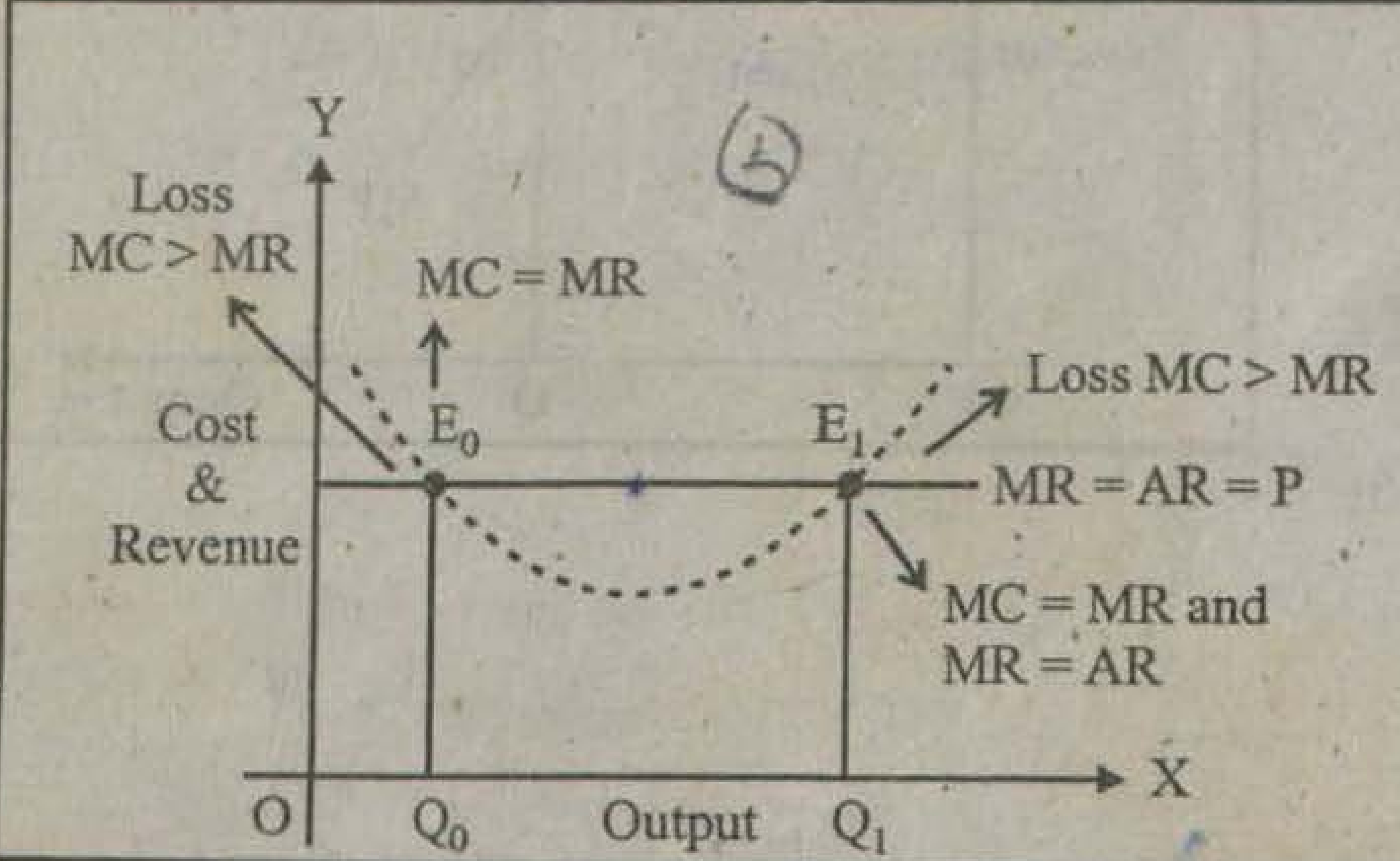
MONOPOLY AND PERFECT COMPETITION

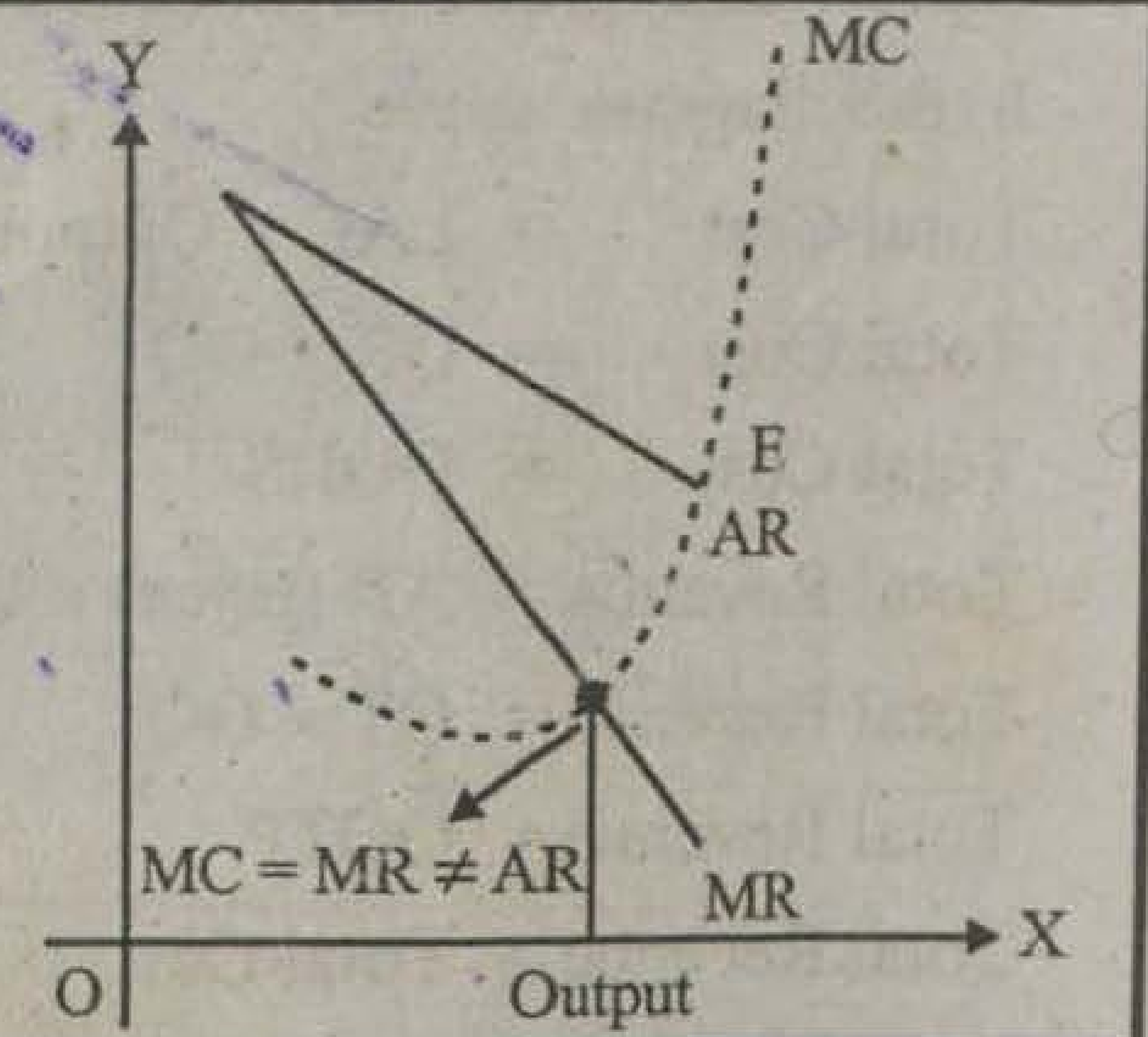
1. Price and output under perfect competition is determined at a point where MC = ATC = Price but price and output under monopoly is determined where MC = ATC but ATC is not equal to price.
2. In perfect competition marginal revenue is equal to average revenue and both the curves overlap and are parallel to x-axis because each firm under perfect competition supplies a very small portion of total supply and none of the firms can influence the price. It can only adjust its output to the prevailing price. Under monopoly marginal revenue curve is below the average revenue curve and both have negative slope which show that if monopoly firm intends to increase its output it has to decrease price of every next unit. A monopoly firm cannot only change output but also influence price.



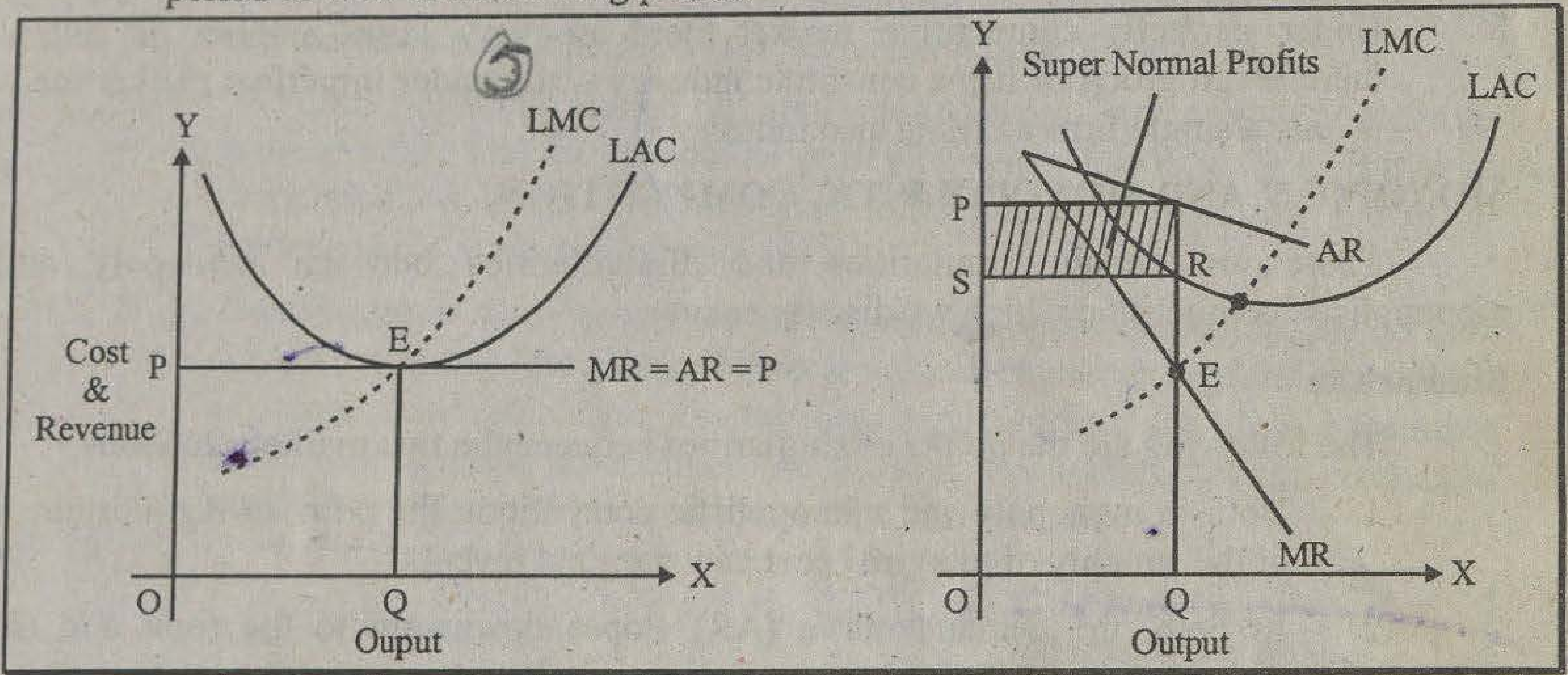


3. Under perfect competition firm's marginal cost is equal to marginal revenue and marginal revenue is equal to average revenue, while under monopoly marginal cost is equal to marginal revenue but marginal revenue is not equal to average revenue.

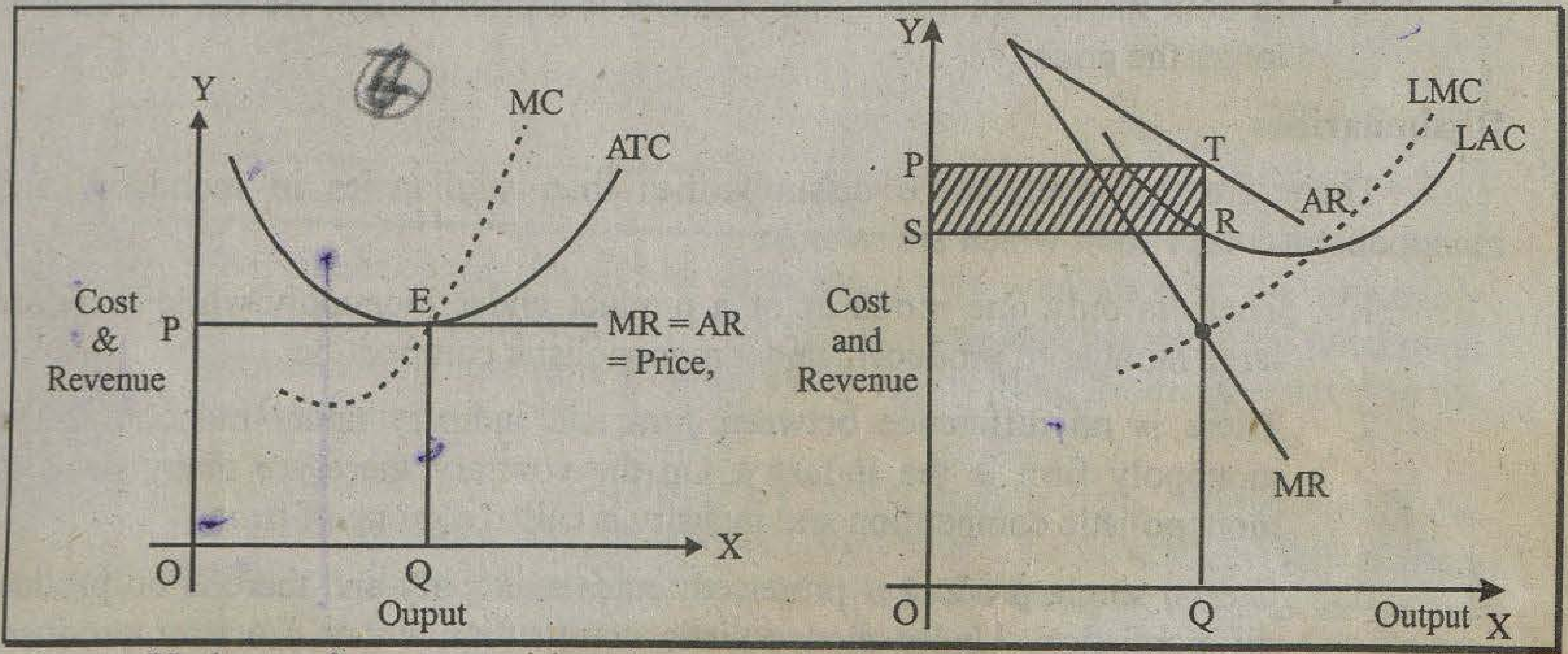




4. In the short period under perfect competition a firm can earn super normal profits or can bear losses or may close business but in the long run a firm only earn normal profits because a firm can change size of the plant and new firms can enter or exit but in monopoly, monopoly firm can earn super normal profits in the short period as well as in the long period.



5. A firm under perfect competition is in equilibrium where average total cost is minimum but a monopoly firm stops its output before average total cost is minimum and ATC curve becomes tangent to AR curve before reaching its minimum position while ATC curve is tangent to AR curve when it is minimum under perfect competition.



6. Under perfect competition there are large number of buyers and sellers, there is free entry and exist of firms, consumers and producers are aware of the market situation, units of one good are homogeneous. Factors are perfectly mobile and transportation cost is negligible hence, price under perfect competition is not only homogeneous but also it is minimum. While a monopoly firm may charge same

price of its product in all the areas but it is not minimum because it has no fear of competitors. There are no close substitutes and new firms cannot enter into business to produce similar product.

7. A firm under perfect competition can only adjust its output but cannot influence price while a monopoly firm can not only adjust its output but can also change the price.

8. Under perfectly competitive market there are very large number of sellers therefore, a group of firms constitute industry while under imperfect market there is only a single firm which is also industry.

MONOPOLY AND MONOPOLISTIC COMPETITION

There are certain similarities and dissimilarities between monopoly and monopolistic competition which we discuss below:

Similarities

The following are the points of similarities between the two market situations:

1. Both in monopoly and monopolistic competition the point of equilibrium is at the equality of marginal cost and marginal revenue.
2. In both, the demand curve (AR) slopes downward to the right and the corresponding marginal revenue curve is below it.
3. In both situations the equilibrium point is below the price line (AR).
4. In both, there is excess capacity. In other words, the demand curve (AR) is not tangent to the long run average costs curve at its minimum point.
5. In both market situations, the producer is a price maker. He can increase or lower the price.

Dissimilarities

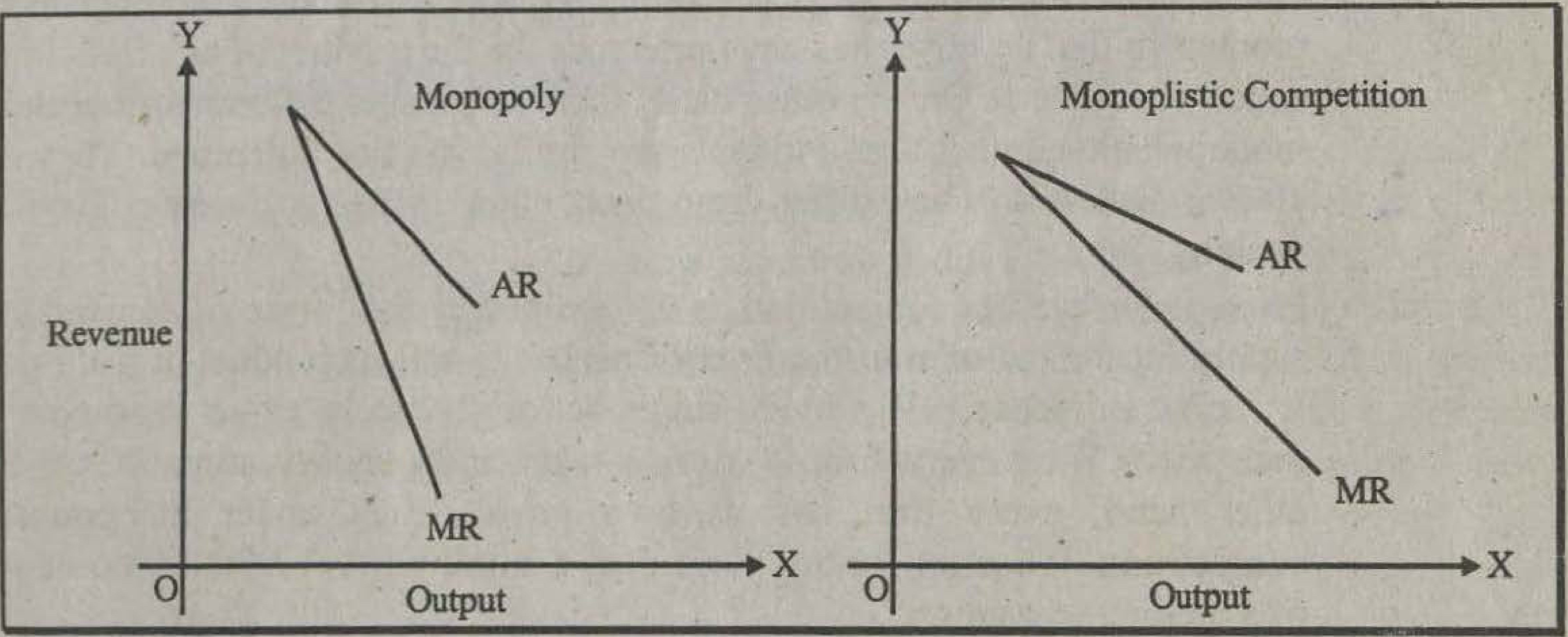
There are, however, more dissimilarities than similarities in monopoly and monopolistic competition which are as under:

1. There is only one producer of a product under monopoly while there are large number of producers under monopolistic competition.
2. There is no difference between firm and industry under monopoly. The monopoly firm is the industry. On the contrary there are many firms in monopolistic competition and industry is called a group of firms.
3. Only a single product is produced under monopoly and there is no product differentiation. Under monopolistic competition every producer produces differentiated products. Products are similar but not identical. They are close substitutes rather than perfect substitutes. They differ from one another in design, colour, flavour, packing etc., As a result, there is product differentiation.

4. There are no selling costs in monopoly because the monopolist has no competitor. However, when the monopoly firm is established the monopolist may spend some money on advertisement to acquaint the consumers about his product. But he will spend on advertisement only once. On the other hand, due to large number of firms and existence of competition among them, expenditure on selling cost is essential under monopolistic competition.

5. The monopolist can charge different prices from different customers for the same product and can adopt the policy of price discrimination. But price discrimination is not possible under monopolistic competition due to the presence of 'competitive' element in it.

6. There being no close substitutes of the product under monopoly, the demand for his product is less elastic. Therefore, the demand curve of the monopolist is steep, i.e., less elastic. On the contrary, products are close substitutes under monopolistic competition. As a result, the demand for the product of every firm is more elastic and its demand curve is flat.



7. The inference can be drawn from the above analysis that the monopoly prices are higher than the price under monopolistic competition. Moreover, the monopolist has more freedom in fixing the price for his product than the monopolistic competitor.

8. Firm can enter and leave the 'group' under monopolistic competition in the long run because the element of competition is present in this market situation. Since the monopolist has full control either over the price or the supply, no firm can enter the monopoly industry.

9. There being no fear of entry of new firms in monopoly, the monopolist earns supernormal profits even in the long run; whereas firms earn only normal profits in the long run under monopolistic competition because the firms can enter and leave the 'group'.

PERFECT COMPETITION AND IMPERFECT COMPETITION

Similarities

The two market situations have the following points of similarities:

1. The number of firms is large both under perfect competition and monopolistic competition.
2. In both, firms compete with each other.
3. In both, there is freedom of entry and of exist of firms.
4. In both, the equilibrium is established at the point of equality of marginal cost and marginal revenue.
5. In both the market situations, firms can earn supernormal profits or incur losses in the short run. But in the long run, firms earn only normal profit.

Dissimilarities

There are, however certain points of dissimilarities between perfect competition and monopolistic competition which are discussed as under:

1. Under perfect competition, each firm produces and sells a homogeneous product so that no buyer has any preference for the product of any individual seller over others. On the other hand, there is product differentiation under monopolistic competition. Products are similar but not indentical. They are close substitutes. They differ from each other in design, colour, flavour, packing, etc.,
2. Price, under perfect competition, is determined by the forces of demand and supply for the entire industry. Every firm has to sell its product at that price. It cannot influence prices by its single action. It has to adjust its output to that price. Thus every firm is a price taker and quantity adjuster. On the other hand, every firm has its own price policy under monopolistic competition. It cannot control more than a small portion of the total output of a product in a group.
3. Geometrically, the demand curve (AR) of a firm is perfectly elastic under perfect competition and the marginal revenue (MR) curve coincides with it. As against this, the demand curve of a firm is elastic and downward sloping under monopolistic competition, and its corresponding MR curve lies below it. It implies that a firm will have to reduce the price of its product to increase its sales by attracting some customers of its competitors, provided the latter do not reduce their prices.
4. Though the equilibrium conditions of the two market situations are the same, yet there are differences in the price marginal cost relationship between the two. When under the perfect competition MC = MR, price also equals them since price (AR) = MR. i.e., MC = AC = MR = AR = Price. In monopolistic competition MC = MR and MR

5. Another difference between the two market situations relates to their size. In the long run, competitive firms are of the optimum size and produce to their full capacity because price = LMC = LAC at its minimum. But under monopolistic competition, the firms are of less than the optimum size and posses excess capacity because the AR curve is downward sloping and cannot be tangent to the LAC curve at its minimum point.

6. Another difference between perfect competition and monopolistic competition relates to selling costs. There is no selling problem under perfect competition where the product is homogeneous. The firm can sell at the ruling market price any quantity of its product. But under monopolistic competition where the product is differentiated, selling costs are essential to push up the sales. They are incurred to persuade a buyer to purchase one product in preference to another.

7. The last difference between the two market situations is that the amount of the firm under monopolistic competition is smaller and price higher than under perfect competition.

PRICE DISCRIMINATION/DISCRIMINATIVE MONOPOLY

Price discrimination means charging different prices from different customers or for different units of the same product. According to Joan Rebbinson. "The act of selling the same article, produced under single control at different prices to different buyers is pronouns as price discrimination". It is possible only when it is impossible to transfer any unit of the commodity from the cheap market to the dearer market i.e., when market is imperfect for this reason it is said that price discrimination is not possible under perfect competition because none of the firms can charge higher price above the minimum price.

TYPES OF PRICE DISCRIMINATION

1. According to Person

It may be personal based on the incomes of the consumers e.g., charging of higher fees by the doctors from rich class and lower fees from poor class.

2. According to the Nature of the Product

Price discrimination may be based on the nature of the product. Unbranded products like computers are sold at low prices than a branded computer or in the winter season hotels and rest houses are available at very low rates while in summer season higher rates are charged in the northern areas.

3. According to Time of Service

Pakistan telecommunication charges has full rates for NWD calls from 6.30 A.M to 6.30 P.M, charges half rates for NWD calls from 6.30 P.M to 10.30 P.M (9.30 P.M in winter) and quarter rates from 9.30 P.M. to 6.30 A.M.

4. According to Age, Sex and Status

Charging less from the children by the barbers, charging low rates from ladies and military personnel in the cinema halls.

5. Geographical or Local Discrimination

Low prices are charged in those markets where majority of buyers is poor class and higher prices where majority is rich class.

6. Based on the use of the Product

Pakistan Railways, and P.I.A are charging different fairs for different classes.

Price discrimination is profitable for the seller under the following conditions:

1. Market Imperfections

The individual seller is able to divide and keep the market into separate parts only if it is imperfect. Customers do not move readily from one market to another because of ignorance of interalia.

2. Agreement between Rival Sellers

Price discrimination is only profitable when the seller of a commodity is a monopolist or when rival sellers enter into an agreement for the sale of the product to different customers.

3. Geographical or Tariff Barriers

The monopolist may discriminate between home and foreign buyers by selling at a lower price in the foreign market than, in the domestic market. It can only be successful if the commodities sold abroad cannot be returned to the home country by tariff restrictions.

4. Differentiated Product

It is profitable to seller when buyers need the same service in connection with differentiated products e.g., Railway, PIA and other transport services charge different rates for the transport of different passengers and goods.

5. Ignorance of Buyer

Discrimination is also profitable when small manufactures sell goods made on order. They charge different rates to different buyers depending upon the intensity of their demand for the product.

6. Artificial Differences between Goods

A monopolist may create artificial differences by presenting the same commodity in different quantities. The seller may present it under different names and label, one for the rich and snobbish buyers and the other for the ordinary consumers.

7. Difference in Demand

For profitable discrimination the demand in the separate markets must be considerably different. Different prices can be charged in the separate markets based on differences of elasticity of demand. Low price is charged where demand is more elastic and high price in the market with the less elastic demand.

PRICE DETERMINATION UNDER DISCRIMINATING MONOPOLY

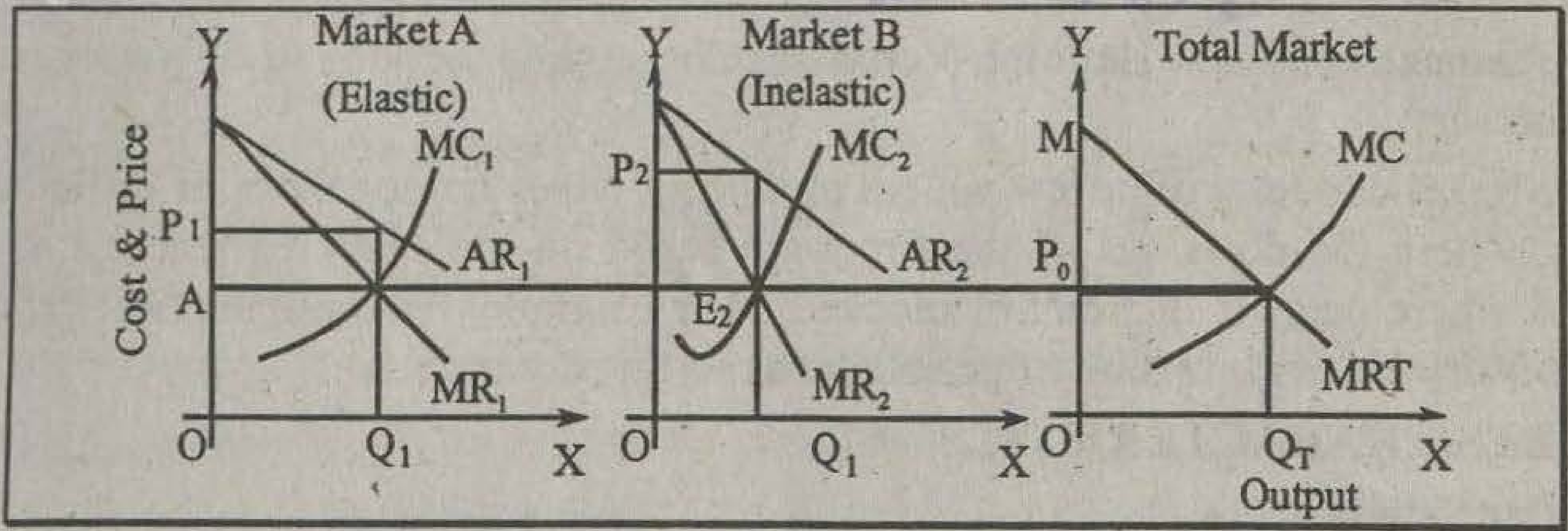
Price discrimination is possible when monopolist divides the buyers of his product or services into two or more groups and then charges different prices to each group. The analysis is based on the following assumptions:

1. He produces that product at which MC = MR. As he sells his output in two different markets, adjusts his output that MR in both the markets are equal. Assuming no change in MC of the product the most profitable output will be determined at a point where combined MR of both the markets equals.

$$MR_1 = MR_2 = MC$$

2. The number of buyers in each market are large and there is perfect competition among them.
3. No possibility of transfer of commodity from one market to other.
4. The AR curve in each market is downward sloping.
5. The elasticities in two different markets must be different.

Price determination can be explained with the help of diagrams below:



The monopolist sells his output in two markets $MR_1 + MR_2 = MR_T$. The equality of MC and MR curve at E determines the equilibrium level of output OQ_T. The monopolist divides the whole market in market A and market B. In more elastic market the monopolist charges low price and sells more output and in the market charges high price and sells low output and therefore, maximises total profit.

DUMPING

It is another form of price discrimination. Dumping takes place when monopolist sells a portion of his output at very low price in international market and high price in the domestic market. The home market is controlled and protected while international market is free.

ASSUMPTION

1. Total output is not fixed and it can be varied.
2. International market is perfectly competitive and domestic market is monopolistic.

Is price discrimination beneficial for society or not?

(i) Price discrimination is beneficial if it helps in raising economic welfare economic growth and economic development.

(ii) It is beneficial if it helps in reducing inequalities of personal incomes i.e., higher prices from rich class and low prices from poor class.

(iii) It is profitable and beneficial when goods are exported at cheaper prices than sold at home. This will help not only increase in foreign exchange but also outlet of surpluses.

(iv) Price discrimination is harmful when it leads to mal-distribution of resources i.e., output, employment and income are not maximised.

(v) It also leads wastes of resources when higher prices are charged for smaller quantities.

DUOPOLY

Duopoly is a special case of market when there are only two sellers and both the sellers are independent in price and output determination yet a change in price and output of one affects the other, and may set up a chain of reactions.

OLIGOPOLY

5 to 7 sellers

German Economist Heinrich-Von-Stackelberg gave the idea of oligopoly market. It is defined as:

"Market Model with a few sellers producing either homogenous or differentiated products, where the decisions of the firms are based on the expected reaction of other firms and where entry is difficult or blocked". For example, Automobile, Software, Air-crafts, Soft-drinks, organization of petroleum exporting countries.

FEATURES/CHARACTERISTICS

1. Few Sellers

It is a market situation in which the number of firms or sellers producing or trading homogenous or differentiated product is small.

2. Interdependence

It is the unique feature of oligopolistic market that the policies of every producer directly affect each other because the products are good substitues. They have high cross elasticities of demand. Therefore, pricing and output decisions of one firm are considered by the other firms.

3. Advertisement

Because of interdependence and substitutes an oligopolist firm spends much in advertisement. It is said that "Advertising can become a life and death matter".

4. Competition

True competition consists of the life of constant struggle, rival against rival, which one can only find under oligopoly.

5. Lack of Uniformity

Another feature of oligopoly market is the lack of uniformity in size of firms. Some may be small and other may be large. Uniformity is rare.

6. Demand Curve

Since under oligopoly the exact behaviour pattern of a producer cannot be ascertained with certainty, the demand curve cannot be drawn accurately, and with definiteness.

7. No Unique Pattern of Pricing Behaviour

Because of interdependence and rivalry all rivals enter into a formal agreement with regard to price and output changes. It leads to a monopoly under oligopoly. For example, OPEC determining the price of oil and output regularly.

8. Barriers to Entry

Since there is monopoly power under oligopoly, the existing sellers or firms create artificial barriers to new entry, for example, Government restrictions, licences, and patents.

CHAPTER ROUNDUP

1. **Conditions of perfect market**
   - (i) Very large number of buyers & sellers.
   - (ii) Homogenous product
   - (iii) Absence of Artificial Restrictions.
   - (iv) Freedom of entry and exist of firms.
   - (v) Perfect mobility of goods and factors of production.
   - (vi) Perfect knowledge of market conditions.
   - (vii) Absence of transport cost.
2. **Demand Curve:** The demand curve facing each firm under perfect competition is horizontal, because variations in the firms output have no considerable effect on price.
3. When price is fixed, average revenue, marginal revenue and price are all equal to each other i.e., MR = AR = Price.
4. **TC and TR curves:** The firm chooses that level of output for which the gap between the total revenue and total cost curve is the largest.
5. **Equilibrium Conditions:** A firm's equilibrium conditions in the perfect competition are:

(i) MC = MR and MC cuts MR from its below.

(ii) MC = AC = Price.

(iii) Total Cost = Total Revenue.

(iv) A firm is earning normal profits.

6. **Supply Curve:** In perfect competition, the firm's supply curve is its marginal cost curve for those level of output for which marginal cost is above the average variable cost.

7. **Monopoly:** It is a market situation where there is a single seller, producer or trader of the product and there are no close substitute of product, served, traded or produced and there are barriers to new entry.

8. **Marginal Revenue:** Marginal revenue of monopoly, firm is less than price (AR) because price must be lowered to sell an extra unit.

9. **The Equilibrium of Monopoly:** The monopoly maximises its profits by producing that level of output where marginal cost equals marginal revenue.

10. **Discriminating Monopoly:** When a monopolist charges different prices from different people for the same product it is called price discrimination.

11. **Long Run Profits:** The monopoly can earn positive profit in the long run if there are barriers to entry.

12. **Imperfect Competition:** It is a market situation when there are large or many sellers of the differentiated product and there is free entry and exist of firms the demand curve (AR) is more elastic than monopoly.

13. **Dumping:** It takes place when monopolist sells a position of output at a very low price in foreign market and at a high price in the domestic market.

SHORT QUESTION ANSWER

Q.1 Define local market.

Ans. Local Market: The market of those goods which are sold in the area where they are being produced is called local market. It is generally a market of those goods which have more weight and less value or these are perishable.

Q.2 Define regional market.

Ans. Regional Market: The market of those goods which are bought and sold in a specific area or region is called regional market e.g., Peshwari Turban, Sindi Ajrak, Punjabi Dhoti and Baluchi dress etc.,

Q.3 Define national market.

Ans. National Market: The market is said to be national when goods are bought and sold in the country. These goods normally have less weight and more value, or those goods whose demand is more and price is homogeneous in the country.

Q.4 Define day to day market.

Ans. Day to Day Market: The market where the whole product is sold in a day is called the day to day market. Price in this market is determined through the forces of demand and supply daily.

Q.5 Define short period market.

Ans. Short Period Market: Short period market is that market where supply of goods can be increased upto some extent with an increase in demand. The supply can be increased only by increasing the number of labour and raw material.

Q.6 Define long period market.

Ans. Long Period Market: Long period is a period in which not only the variable factor of production but also the fixed factor of production can be changed. In the long period market supply is more effective than the demand because price is determined keeping in view the supply.

Q.7 Differentiate perfect market and imperfect market.

Ans. Perfect and Imperfect Markets: Perfect market is that market wherein the price of the output sold is minimum and homogeneous

The market where the price is not minimum and homogeneous in this market price may be same but it is not minimum.

Q.8 What are the conditions of imperfect market?

Ans. Conditions of Imperfect Market:

(i) No Knowledge of Price
(ii) Differentiated Product
(iii) Shortage of Firms
(iv) Factors are not Perfectly Mobile
(v) Price Policy
(vi) Demand Curve

Q.9 Differentiate general market and specialized market.

Ans. General Market: The market where all types of goods are bought and sold is called general market.

Specialized Market: The market where only a single commodity is sold e.g., fruit market.

Q.10 Differentiate between marketing by samples and marketing by grades.

Ans. Marketing by Samples: The market where the buyers need not to check the whole quantity they just examine the samples.

Marketing by Grades: In this market goods are sold by grades. Grades of goods are prepared and sometimes only a number is allotted to a grade and people understand by that number.

Q.11 What do you understand by equilibrium of firm?

Ans. Equilibrium of the Firm and Industry: Equilibrium means a state of balance when forces acting in opposite directions are exactly equal. A firm is said to be in equilibrium position when there is no incentive for a firm either to expand or to contract its output.

Q.12 What are the rules for profit maximization?

Ans. Rules for Profit Maximising:

Rule No. 1: A firm should not produce at all if, for all levels of output, the total variable cost of producing that output exceeds the total revenue derived from selling it or, equivalently, if the average variable cost or producing the output exceeds the price at which it can be sold.

Rule No. 2: Assuming that it is worth while for the firm to produce, the firm should produce the output at which marginal cost equals marginal revenue.

Rule No. 3: For output where marginal cost equals marginal revenue to be profit maximising rather than profit minimising, it is sufficient that marginal cost be less than marginal revenue at slightly lower outputs and that marginal cost exceed marginal revenue at slightly higher outputs.

Q.13 What is a short run equilibrium of firm under perfectly competitive market?

Ans. Short Run Equilibrium under Perfect Competition: Short run is the period of time, when a firm can only change variable factors of production. The firm is in equilibrium when it is earning just normal profits.

Q.14 What is the optimum level of output for a firm?

Ans. The Optimum Output: Firm's optimum output is at a point where marginal cost is equal to marginal revenue.

Q.15 Define monopoly market.

Ans. Monopoly: Monopoly may be defined as a condition of market where there is only one seller or producer and there are no close substitutes of the commodity which is being sold or produced by the monopolist and there are barriers to new entry.

Q.16 What are economic barriers under monopoly?

Ans. **Economic Barriers:** We mean that the consumers are best served by a single firm and it is not profitable for other firms to sell or produce at the same price. The total market is not being enough to permit even one more firms to operate at the optional scale of production.

Q.17 What are artificial barriers adopted by a monopoly firm?

Ans. **Artificial Barriers Adopted by a Monopoly Firm:** The artificial barriers may be of three types:

(i) A firm may be enjoying the exclusive control or ownership of raw material which is necessary to produce the similar product or products.

(ii) A firm may be enjoying the patent rights.

(iii) Entry of new firms may be blocked by decreasing the price of product lowering than the cost of production.

Q.18 Define natural monopoly, legal monopoly, social monopoly and implied monopoly.

Ans. **Natural Monopoly:** When climatic conditions of an area or a country are favourable for production of a commodity or nature has gifted an area or a country with some minerals it is called natural monopoly.

Legal Monopoly: If a firm or an institution is allowed to produce or supply or produce commodity/service it is called legal monopoly.

Social Monopoly: When for the welfare of the people, the rights of producing or selling of a commodity or providing services are given to an institution, it is called social monopoly.

Implied Monopoly: When the entry of new firms is blocked by a single firm or group of firms or the rivals are eliminated by aggressive cut throat tactics, it is called implied monopoly.

Q.19 Define price discrimination.

Ans. Price discrimination means charging different prices from different customers or for different units of the same product. According to Joan Rebbinson. "The act of selling the same article, produced under single control at different prices to different buyers is pronouns as price discrimination".

Q.20 Define dumping.

Ans. **Dumping:** It is another form of price discrimination. Dumping takes place when monopolist sells a portion of his output at very low price in international market and high price in the domestic market. The home market is controlled and protected while international market is free.

Q.21 Is Price Discrimination Beneficial for Society or Not?

Ans. (i) Price discrimination is beneficial if it helps in raising economic welfare economic growth and economic development.

(ii) It is beneficial if it helps in reducing inequalities of personal incomes i.e., higher prices from rich class and low prices from poor class.

(iii) It is profitable and beneficial when goods are exported at cheaper prices than sold at home. This will help not only increase in foreign exchange but also outlet of surpluses.

(iv) Price discrimination is harmful when it leads to mal-distribution of resources i.e., output, employment and income are not maximized.

(v) It also leads wastes of resources when higher prices are charged for smaller quantities.

Q.22 Define and differentiate duopoly market and oligopoly market.

Ans. **Duopoly:** Duopoly is a special case of market when there are only two sellers and both the sellers are independent in price and output determination yet a change in price and output of one affects the other, and may set up a chain of reactions.

Oligopoly: "Market Model with a few sellers producing either homogenous or differentiated products, where the decisions of the firms are based on the expected reaction of other firms and where entry is difficult or blocked".

Q.23 Define price cartel or price ring and collusion.

Ans. **Price Cartels by Oligopolist Producers:** A price cartel or price ring is created when a group of oligopoly firms combine to agree on a price at which they will sell their product to the market. Cartel agreement attempts to charge a higher price by restricting supply.

Each oligopoly firm could increase its profits if all the big firms in the market charge the same price and split the output between them. This is known as collusion.

Q.24 When price leadership occurs?

Ans. **Price Leadership:** Price leadership occurs when all the firm realize that price initiated by one firm is beneficial to them, so follow the leader and charge the same price.

Q.25 What is kinked demand curve?

Ans. **Kinked Oligopoly Demand Curve or Sweezy's Model of Oligopoly:** Sweezy believed that the rival firms will follow a price decrease policy but will not follow a price increase policy. This gives a kinked demand curve. The kinked demand curve shows that the demand curve will be more elastic before a certain point and less elastic after that point.

Q.26 Define price leadership and price wars under oligopoly market.

Ans. **Price Leadership:** In oligopoly markets there is a tendency for one firm to set the general industry price, with the other firms following it. This is called price leadership.

Price War:

(a) If total market demand falls, oligopolists might try to increase their share of the market by cutting prices.

(b) Similarly, if one oligopolist begins to lose his share of the market, he might try to restore it by cutting prices. The consequence would be a price war.

Contestable Market: A market situation when a small number of firms are in competition like perfectly competitive market.

EXERCISE

Q.1 Explain the concept of market. What are the determinant factors of extent of market?

Q.2 What are the forms of markets? Differentiate between perfect market and imperfect market.

Q.3 Explain the meaning of Equilibrium of the firm. How a firm reaches equilibrium position with the help of total revenue and total cost.

Q.4 Discuss the equilibrium of the firm in the short period under perfect competition.

OR

What do you understand by firm's equilibrium. What are the conditions of this equilibrium?

OR

A firm is in equilibrium where its marginal revenue and marginal cost are equal. Explain.

OR

Explain the process by which a firm attains equilibrium under conditions of perfect competition.

OR

Explain why a firm earns maximum profits when MR = MC.

OR

Prove that when MC = AC = Price a firm is in equilibrium.

OR

A firm is in equilibrium in the perfect competition when it is earning normal profits.

OR

A firm under perfect competition is in equilibrium when MC = MR and MC curve cuts MR curve from its below.

Q.5 Explain the different situations of equilibrium of the firm under perfect competition in the short period:

(a) When firm is earning normal profits.

(b) When firm is earning super normal profits.

(c) The firm incurring losses, but does not shut down.

(d) Shut down point.

Q.6 How a firm reaches equilibrium in the long run.

Q.7 How a firm reaches equilibrium in the short run.

Q.8 Define Monopolistic Competition. What are its characteristics? Discuss the price output determination under monopolistic competition in the short run and in the long run.

Q.9 Differentiate between monopoly and monopolistic competition. OR

Given points of similarities and dissimilarities between monopolistic competition.

Q.10 Differentiate between Monopolistic Competition and Perfect Competition.

Q.11 Explain the concept of monopoly also illustrate merits and demerits of monopoly. How price and output is determined under monopoly?

Q.12 Compare and differentiate price output determination under perfect competition and monopoly with the help of diagram?

Q.13 What do you understand by Price discrimination? When it is profitable and possible?

Q.14 Explain the kink in the demand curve under oligopoly and describe price leadership.

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CHAPTER

8

PRICING OF FACTORS OF PRODUCTION

DISTRIBUTION

In economics the term distribution refers to personal and functional distribution of income.

1. Personal Distribution

Personal distribution relates to the forces governing distribution of income and wealth among the various individuals of a country. Under personal distribution, we study the pattern of the distribution of national income and pattern of the distribution of national income and the shares received by the different classes.

2. Functional Distribution

Functional distribution of income or factor share distribution explains the share of total national income received by each factor of production or it relates to the distribution of rewards for the services of the factors of production. The reward of land is rent, reward of labour is wage, reward of capital is interest and the reward of entrepreneur is profits.

There is a close relation between the two. The personal distribution is ultimately affected by its functional distribution of income. If the rewards of FOP are just and equitable. As a result, individual incomes are high. Higher personal income means, higher living standard and greater efficiency of factors of production.

MARGINAL PRODUCTIVITY THEORY

According to marginal productivity theory "The reward of a factor of a production tends to equal to its marginal revenue product. Greater is the productivity greater is the reward, lower is the productivity lower is the reward". The theory explains how national income produced by factors of production is again distributed among the factors of production.

The entrepreneur while employing the various factors of production acts on principle of substitution. He keeps on substitution one factor for the other till the marginal productivity of factors of production equalise. The employer will keep on employing factors of production (e.g., labour) till its marginal productivity comes equal the reward of labour (wages).

The theory is based on the following assumptions:

1. **Perfect Competition in Factors Market and Commodity Market**

Theory holds when there is perfect competition in factors market i.e., reward of a factor of production is not only homogeneous, but also minimum and perfect competition exist in commodity market.

2. **Homogeneous Units of a Factor of Production**

It is assumed that all the units of one factor of production are homogeneous i.e., all the units of labour are homogeneous in physical health, different parts of land are homogeneous in fertility, units of capital are homogeneous in efficiency and productivity and all the entrepreneurs are homogeneous in ability.

3. **Reward of only one Factor of Production**

Theory is based on the assumption that reward of only variable factor of production is considered because other factors are assumed to be constant.

4. **Factors are substitute of one Another**

It is also assumed that factors are substitute of one another i.e., units of labour can be substituted with units of land or with units of capital or units of land with units of capital etc., can be substituted.

5. **Perfect Mobility of a Factors of Production**

It is assumed that units of a factor of production move from one place to another place, from one area to another area, from one industry to another industry for better rewards.

6. **Law of Diminishing Returns Applies**

Theory is based on the assumption that law of diminishing return applies when units of variable factor of production are increased on fixed factor of production.

7. **Full Employment**

It is assumed that there is full employment of factors of production and resources.

8. **Divisibility**

The theory assumes that the units of the different factor services are divisible.

9. **Profit Maximisation**

That the entrepreneurs are motivated by profit maximisation.

10. **Based on Law of Variable Proportion**

Marginal productivity theory of distribution is based that law of variable proportions operators.

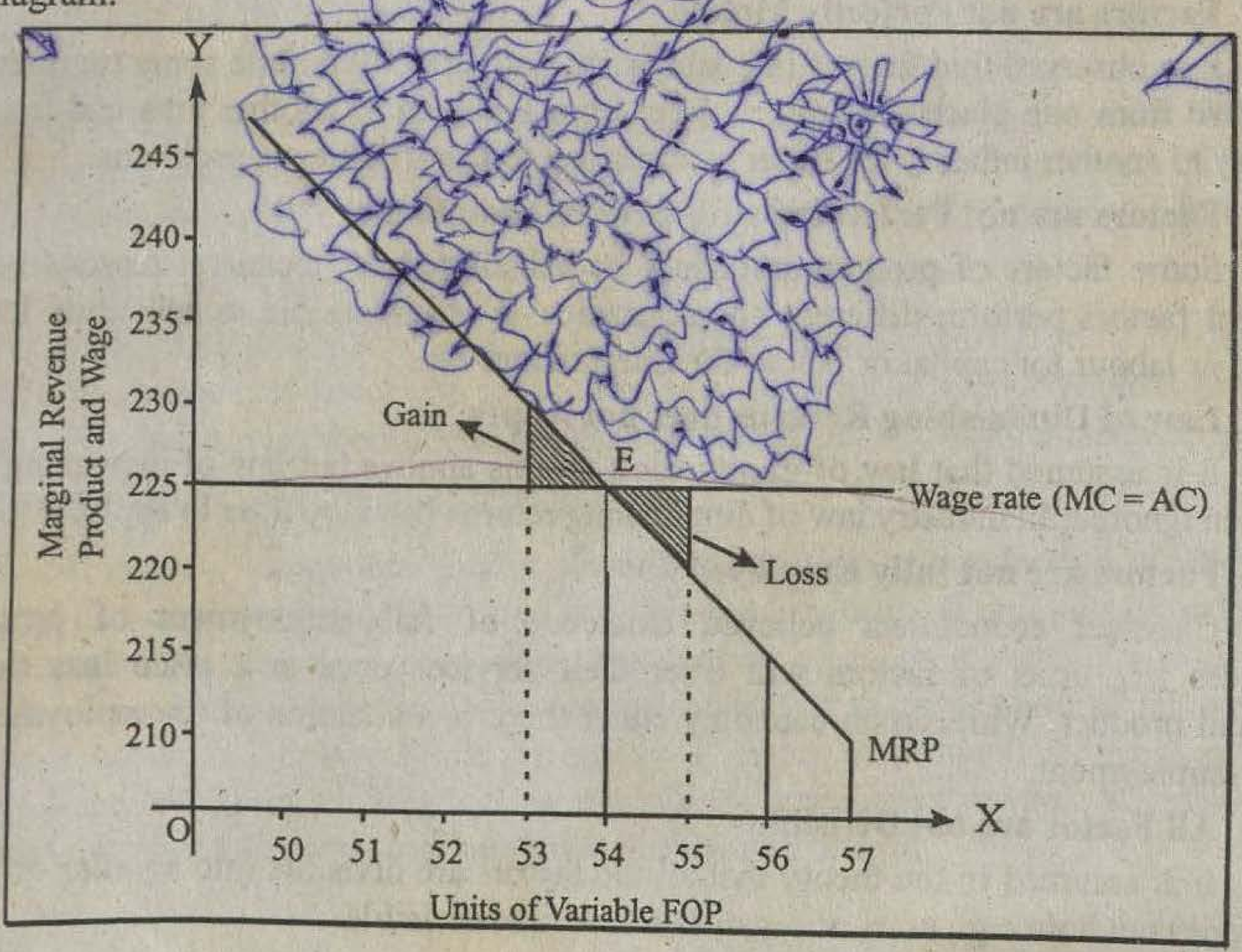
11. **Supply of Variable FOP is Perfectly Elastic**

It is assumed that the FOP will be available as reward which is determined as many units of variable required as prevailing through the forces of demand or supply.

Now the question arises that how many units of one factors of production will be employed, by the entrepreneur. The answer is that as much units of one factor of production will be employed when the marginal revenue product is equal to the prevailing reward. This can be explained with the help of a table and diagram. In the table variable, factor of production is labour.

Units of Variable FOP (Labour)	Marginal Revenue Product (Rs.)	Wage Rate (Rs.)
50	245	225
51	240	225
52	235	225
53	230	225
54	225	225
55	220	225
56	215	225
57	210	225

It is assumed that 49 units of variable factor of production have already been employed, the entrepreneur will employ 54 units because marginal revenue of product of 54th units is equal to prevailing wage rate. If entrepreneur employs 53 units then their is incentive for him to employ one more unit because marginal revenue product of 53rd unit is greater than the wage rate. Entrepreneur will not employ 55th unit because marginal revenue product of 55th unit is lower than the wage rate. It can be explained with the help of a diagram.



Units of variable FOP have been measured on x-axis and wage rate on y-axis. MRP is marginal revenue product curve which is slopping downward. Negative slope represents inverse relation between marginal revenue product and units of variable factor of production. The firm will employ 54th units of variable factor of production. If wage rate increases from Rs. 225 to Rs. 230, firm will employ 53rd units and if wage rate decreases to Rs. 220 then firm will employ 55th unit factor of production i.e., firm goes on employing that much units of variable factor of production when marginal revenue product is equal to prevailing wage rate.

CRITICISM/LIMITATIONS

The theory has been criticised on the following grounds:

1. ASSUMPTIONS DO NOT PROVE TRUE

(a) Lack of Perfect Competition

It is assumed that perfect competition prevails in factors market and commodity market but generally the condition of perfect competition is not satisfied either it is a goods market or factors market.

(b) Units of one Factor of Production are not Homogeneous

The theory proves true when units of one factor of production are homogeneous. But all the workers are not homogeneous in physics and mental abilities, different parts of land are not homogeneous in fertility, all units of capital are not homogeneous in efficiency and different entrepreneurs are not homogeneous in ability.

(c) Factors are not Perfectly Mobile

It is observed that factors like labour are not perfectly mobile some times they do not move from one place to another place, from one area to another area and from one industry to another industry for better rewards due to some domestic problems.

(d) Factors are not Perfect substitutes of one Another

Some factors of production cannot be substituted for technical reasons because different factors perform different characteristics. It is impossible to substitute land for labour, or labour for capital or labour for entrepreneur etc.

(e) Law of Diminishing Returns does not Apply

It is assumed that law of diminishing returns applies but law of increasing return has been ignored. In industry law of diminishing returns has very little to apply.

(f) Factors are not fully Employed

Classical economists believed existence of full employment of productive resources i.e., units of factors will offer their services even at a price less than the marginal product. While in an economy either there is a situation of unemployment and under employment.

(g) All Factor are not Divisible

It is assumed in the theory that all the factors are divisible into smaller quantities but it does not hold e.g., units of organisation are not divisible.

(h) Profit Motive is not the main Motive

The assumption that the profit motive is the base of the theory is not true i.e., more units of factor service are employed when the firm finds the MRP is higher than the reward. But the entrepreneur action is guided by the desire to find a commercial kingdom, to conquer the market and sometimes innovations.

2. DIFFICULT TO FIND OUT MARGINAL PRODUCTIVITY OF ONE FACTOR OF PRODUCTION

Production is a result of combined efforts of factors of production. We cannot separate one factor of production from the production process because production process cannot be started with the help of three factors of production hence, we cannot find marginal productivity of one factor of production separately, and if one factor of production is separated from the production process the gain may be less than the losses so it is not right to say that reward of a factor of production tends to equal to its marginal productivity.

3. IT IS DIFFICULT TO ASSESS MARGINAL PRODUCTIVITY IN CASE OF AGRICULTURE

It is difficult to find marginal productivity in agriculture because in agriculture marginal productivity of labour and land depends on weather conditions also if the weather conditions are favourable, marginal productivity of labour and land increases and vice versa.

4. INTERDEPENDENCE

This theory explains that reward of a factor of production tends to equal to its marginal revenue product while marginal productivity depends on rewards, if reward is increased marginal productivity is increased, i.e., labour work with greater interest hence, productivity increases i.e., both reward and marginal productivity depends on each other.

5. ONLY DEMAND SIDE HAS BEEN CONSIDERED

In the theory supply side of factors of production is assumed to be predetermined while only demand of factors of production has been kept in view. Whereas reward of a factor of production is determined not only by demand but both by demand and supply.

MODERN THEORY OF DISTRBUTION

According to modern theory rewards of factors of production are determined through demand and supply like price is determined by demand and supply under perfect competition. The only difference is that the demand of goods is direct while demand for factors of production is derived. By demand of factors of production which a firm or a business wants to employ. While by supply of factor of production means quantity of units of factor of production which is available at a prevalent reward. Marginal revenue product curve of a factor of production is available for a firm.

The analysis of factor pricing under perfect competition is based on the following assumptions:

(a) There is perfect competition in the product market and the factor market.

(b) The number of buyers and sellers of factor services is large.

(c) All units of a factor of production are homogeneous.

(d) Factors of production are perfectly mobile.

(e) There is perfect substitution between the factors of production and their units.

(f) All factor units are divisible.

(g) Buyers and sellers of factor services have complete knowledge about market conditions.

(h) Buyers and sellers of factor services have complete freedom to enter and exit.

(i) The law of variable proportions operate.

Production process starts with the combined efforts of factors of production.

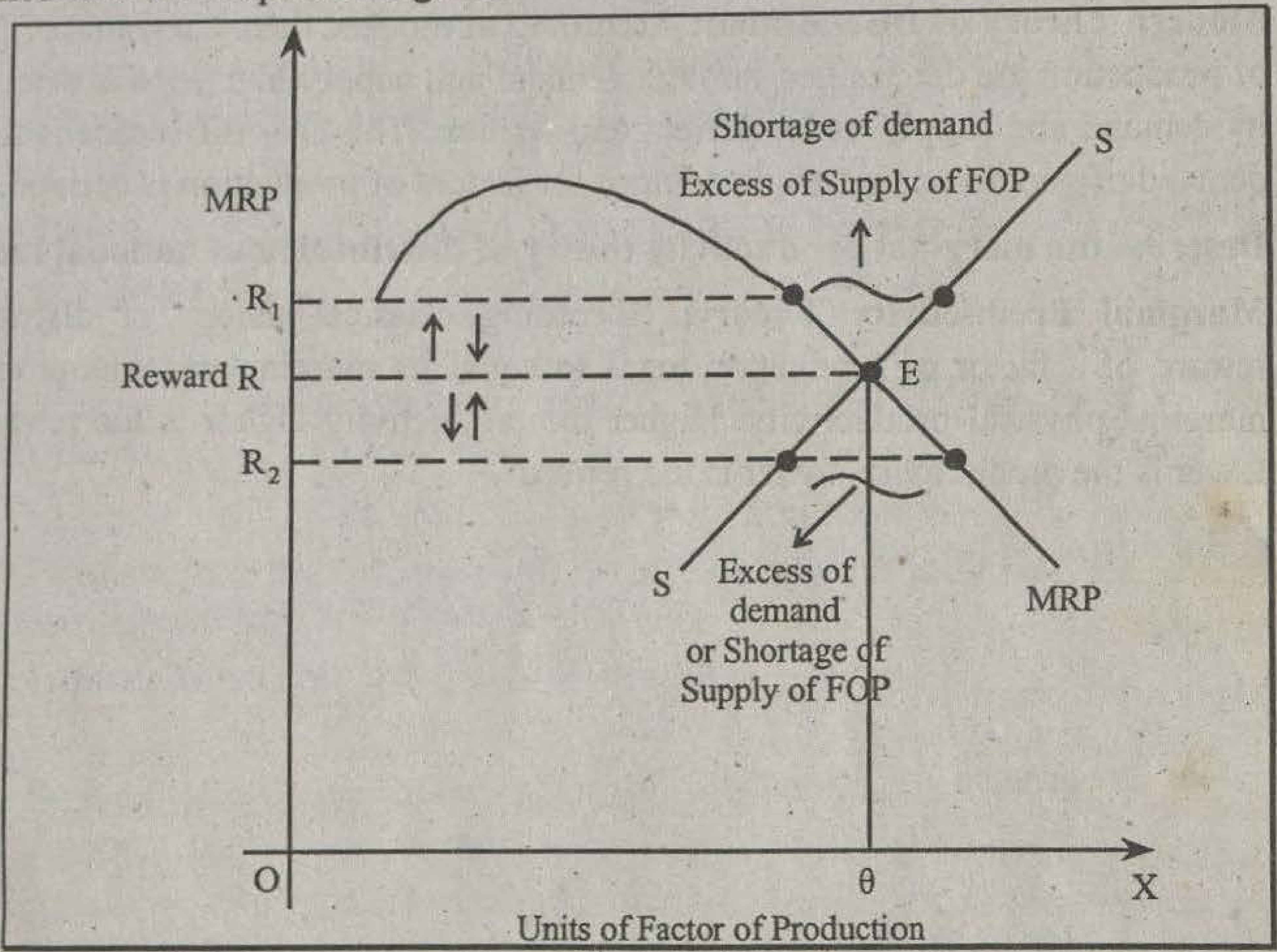
DEMAND SIDE

1. Demand price of a factor depends on the prices of other factors of production. Price of one factor of production affects the prices of other factors of production.
2. Demand for a factor of production depends on the demand of goods produced by these factors of production. If demand for goods increases, demand for factors of production also increases and rewards of factors of production also increase which produce that commodity.
3. Demand for factor of production also depends on technology. With the discovery of new and better techniques of production marginal productivity of factors of production increases and as a result demand price increases. If with discovery of new methods, demand price decreases and demand of a factor of production increases, demand price will also increase if supply of that factor of production does not increase.
4. Demand for a factor of production also depends on the price of the commodity being produced if the commodity produced is costly demand price of factors of production is higher and if commodity is cheaper, demand price will be low.
5. Demand for a factor of production also depends on the quantity and quality of the other factors of production and those units of factors of production which have been employed later on.
6. Demand of a factor of production also depends on the marginal productivity of that factor of production. Higher is the productivity greater the demand, less is the productivity lower is the demand.

SUPPLY SIDE

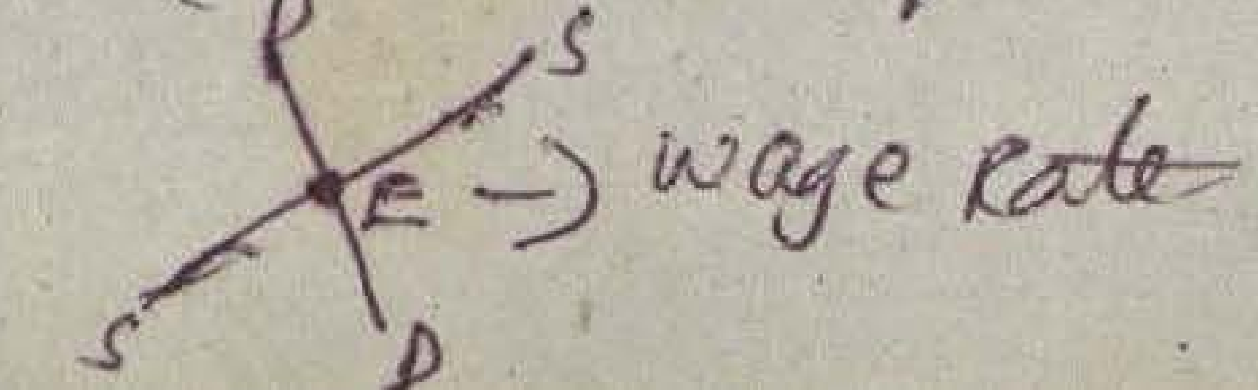
Supply of factor of production is directly related with its reward. Higher is the reward, greater is the supply, less is the reward lower is the supply.

Price determination of factor of production under perfect competition can be explained with the help of a diagram.



MRP is the marginal revenue product curve which is also a demand curve for the firm. SS is the supply curve of factor of production. MRP curve and SS curve both intersect each other at E. Hence, reward of a factor of production is OW and quantity of factor of production is OQ. If reward of a production is OQ. If reward increases from OW to OW_1 demand for factor of production is less than the supply of factor of production. In the competition between the sellers of the services will tend to bring down the reward to OW. On the other hand if reward decreases to OW_2, demand for factor of production is greater than the supply of factor of production hence reward will tend to go up to OW at which demand is equal to supply.

Labour demand & labour side togetherly decide the wage (at their equilibrium point)



SHORT QUESTION ANSWER

Q.1 Define modern theory of distribution.

Ans. Modern Theory of Distribution: According to modern theory rewards of factors of production are determined through demand and supply like price is determined by demand and supply under perfect competition. The only difference is that the demand of goods is direct while demand for factors of production is derived.

Q.2 Describe the marginal productivity theory of distribution of national income.

Ans. Marginal Productivity Theory: According classical theory of distribution, reward of a factor of production tends to equal its marginal revenue product or marginal physical productivity. Higher the productivity higher is the reward and lower is the productivity, lower is the reward".

EXERCISE

Q.1 Explain critically the marginal productivity theory of distribution and also give its limitations.

OR

Explain the marginal productivity theory of distribution assuming perfect competition in the product market and factor market.

OR

What is the role of marginal productivity in determining factor prices? Illustrate with diagrams.

OR

"Price of a factor tends to equal the marginal revenue product of a factor". Discuss.

OR

How national income is distributed among the factors of production. Explain the assumptions and limitations of the theory.

Q.2 Explain the modern theory of distribution.

OR

Explain how price of a factor of production is determined under perfect competition.

OR

'Productivity' and 'Scarcity' are the two main factors which determine the prices of the factors of production". Discuss.

OR

"Although factors of production are not just like goods yet their prices are determined through the forces of demand and supply".

CHAPTER 9

RENT

In ordinary sense rent means hiring charges but in Economics it is portion of the produce paid to the land-lord by the tenant for the use of land only, or rent is a surplus i.e., what a factor of production earns over and above what is essential to maintain its supplies in its present occupation or rent is excess over transfer earnings. Transfer earnings represent the amount which a factor can earn in the next best paid alternative use.

According to David Richardo "Rent is that portion of the produce of the earth which is paid to the landlord for the use of original and indestructible powers of the soil".

THEORY OF RENT Recardian Theory

Richardo has explained his theory of rent by taking an example of newly born country where there are four grades of land. (a) A-grade land which is the most fertile (b) B-grade land which is less fertile than A-grade land; (c) C-grade land which is less fertile than A-grade and B-grade land; (d) D-grade land which just cover its cost of production. Ricardo named D-grade land as marginal land or no rent land and all other types of lands pay rent according to D-grade land or marginal land.

According to the theory of rent people started cultivating A-grade land. In the beginning population was less and A-grade land was more than their needs. So this land did not pay rent but with the passage of time population increased and A-grade land became insufficient because the supply of land is fixed according to the area. People started cultivating B-grade land as this land is less fertile than A-grade land its produce was comparatively less than A-grade land hence, the difference of produce of both lands is rent of A-grade land. If population increases, C-grade land will also be cultivated and B-grade land will also pay rent. With the increase in population D-grade land or marginal land is cultivated, C-grade land starts paying rent, but D-grade land will not pay rent being marginal land. This can be explained with the help of a table.

Suppose that cost per unit of variable factor of production which is applied on land is equal to 25 quintals of wheat.

Units of Variable FOP	Production of A-Grade Land	Production of B-Grade Land	Production of C-Grade Land	Production of D-Grade Land
1	40	35	30	25
2	35	30	25	20
3	30	25	20	15
4	25	20	15	10
5	20	15	10	5

It is clear from the table that only 4 units of variable FOP will be applied on A-grade land because 4th units production is equal to its cost and so 3 units on B-grade land, 2 units on C-grade land and only one unit of variable FOP will be applied on D-grade land. Rent of A-grade, B-grade, C-grade and D-grade lands can be calculated as under:

Rent = Total production (–) Total Cost.

Rent of A-grade Land

Total Product = 40 + 35 + 30 + 25 = 130 Qnt.

Total Cost = 4 × 25 = 100 Qnt.

Rent = 130 – 100 = 30 Quintals.

Rent of B-grade Land

Total Product = 35 + 30 + 25 = 90 Qnt.

Total Cost = 3 × 25 = 75 Qnt.

Rent = 90 – 75 = 15 Quintals.

Rent of C-grade Land

Total Product = 30 + 25 = 55 Qnt.

Total Cost = 2 × 25 = 50 Qnt.

Rent = 55 – 50 = 5 Quintals.

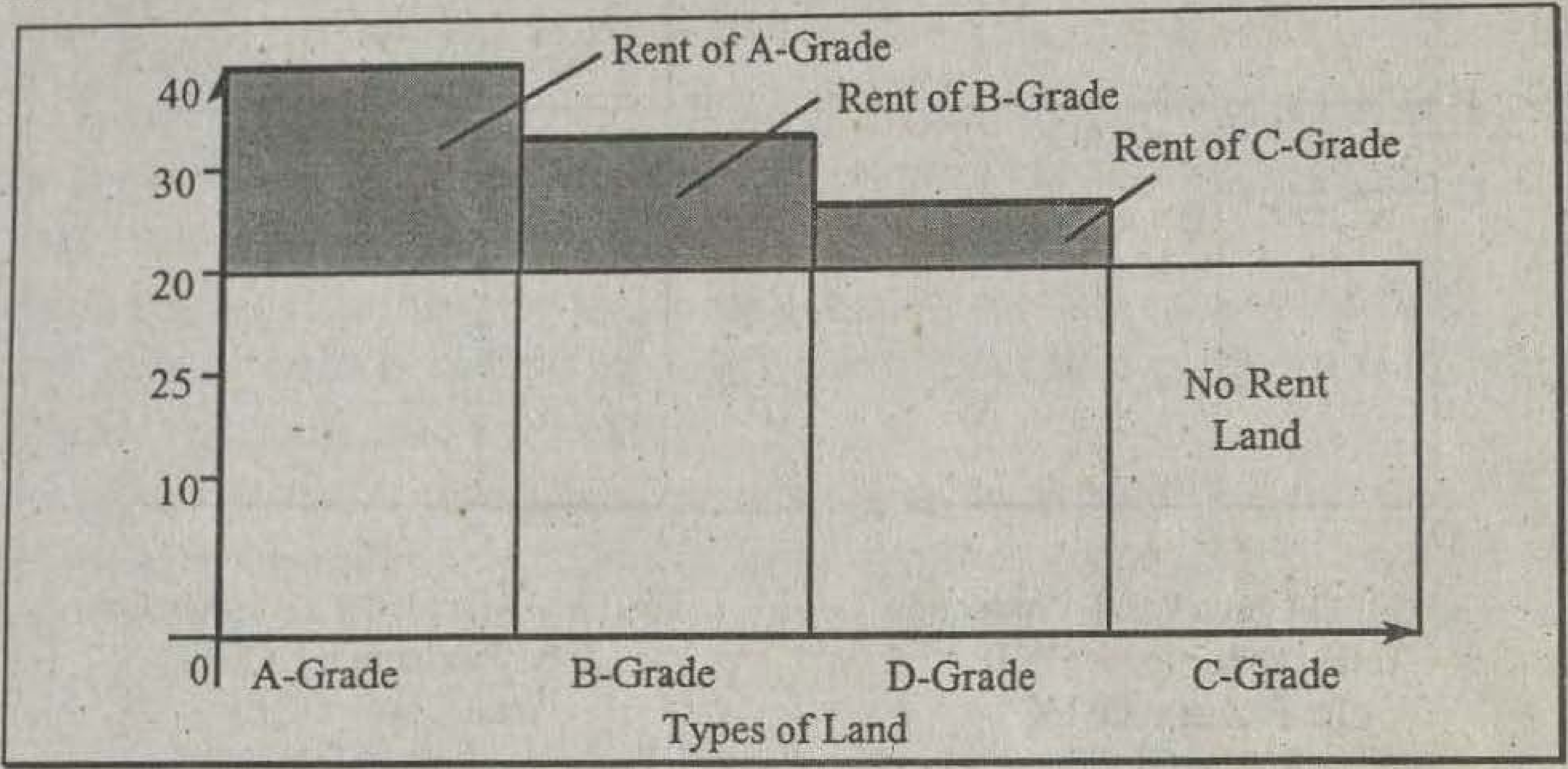
Rent of D-grade Land

Total Product = 25 Qnt.

Total Cost = 25 Qnt.

Rent = 25 – 25 = Zero.

Rent according to difference in produce can be explained with the help of a diagram:



In the diagram all the four types of land have been shown on x-axis and produce on y-axis. Rent of A-grade, B-grade and C-grade lands has been shown by shaded portion. D-grade land will not pay rent being marginal land because it just covers its cost of production.

Major flaw in this diagram is that it only shows the produce of lands and not cost of production. Ricaridian theory of rent can be well explained with the help of following diagrams:

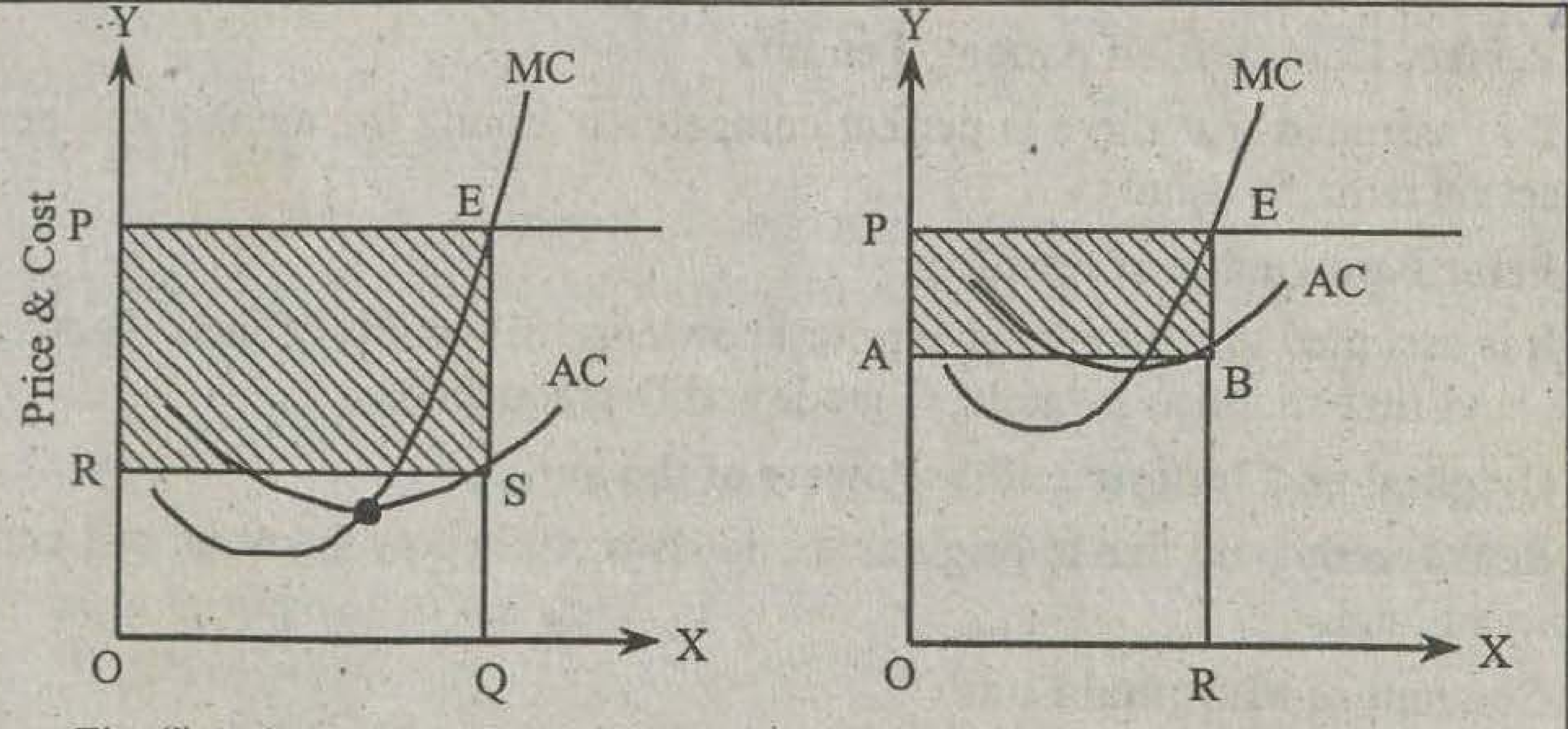


Fig. (i) A-Grade Land, Production
Total Production = OQEP
Total Cost = OQSR
Rent = RSEP

Fig. (ii) B-Grade Land, Production
Total Prouction = OREP
Total Cost = ORBA
Rent = ABEP

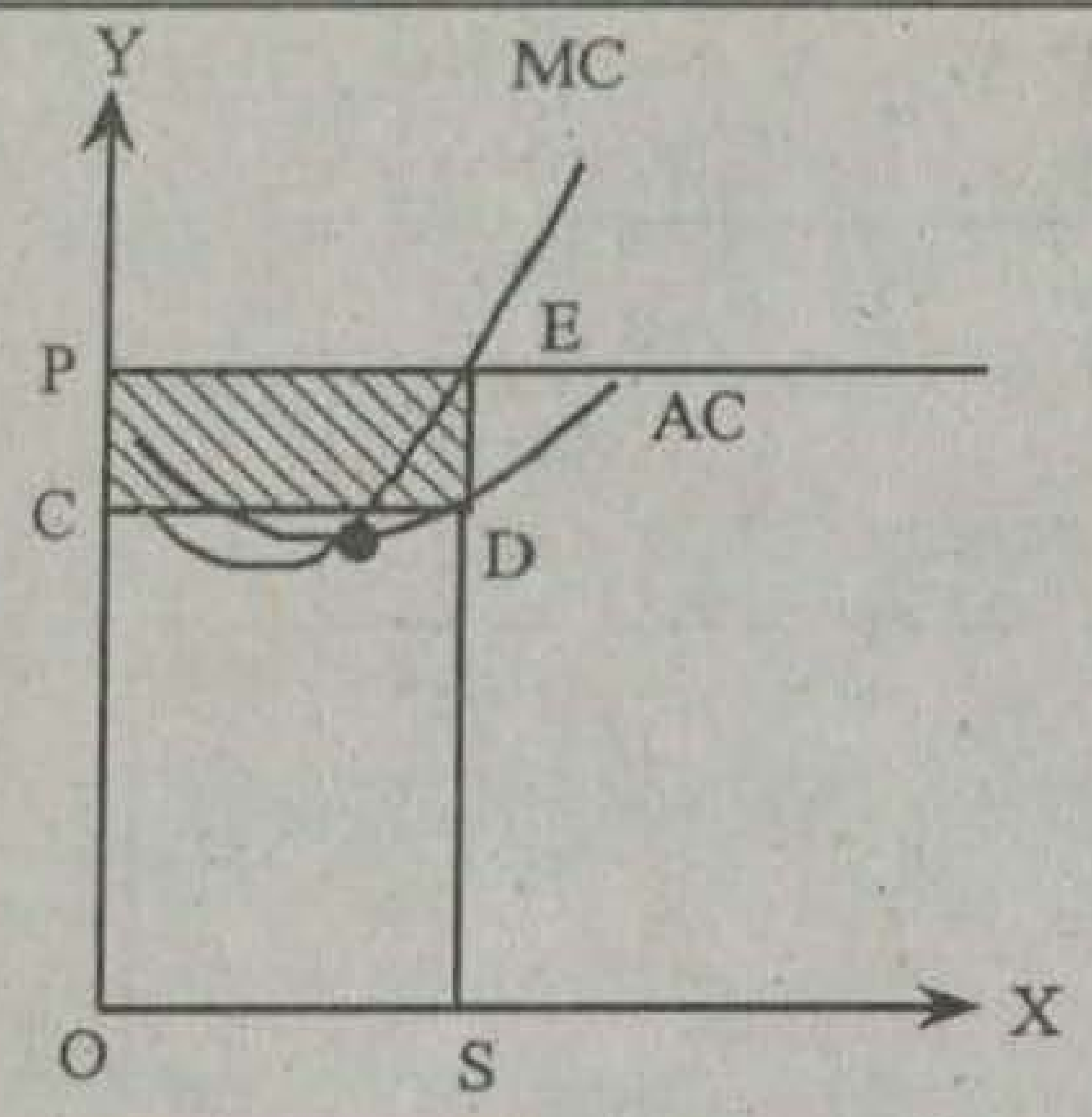


Fig. (iii) C-Grade Land, Production
Total Production = OSEP
Total Cost = OSDC
Rent = CDEP

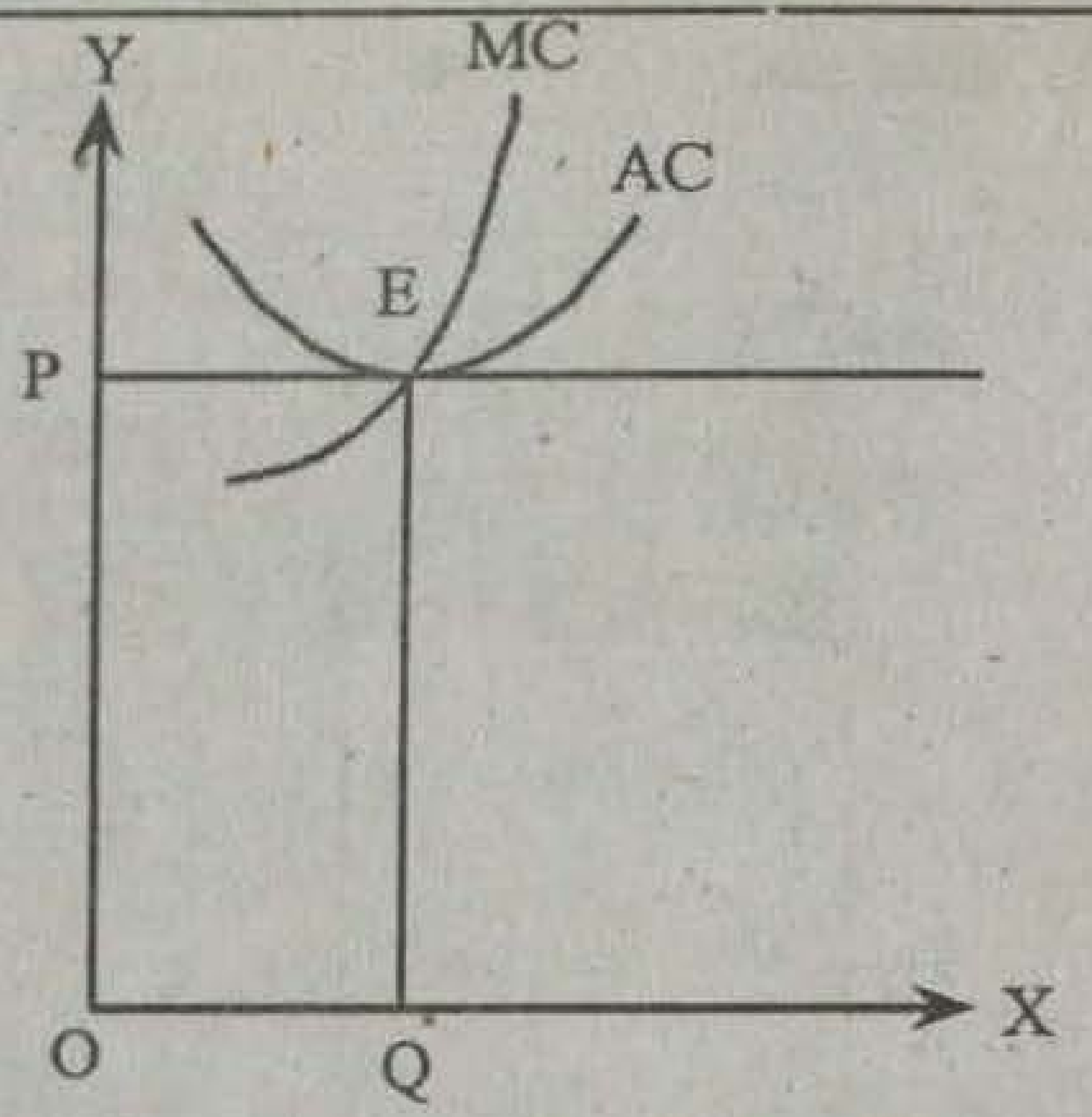


Fig. (iv) D-Grade Land, Production
Total Production = OQEP
Total Cost = OQEP
Rent = Zero

Fig. (i) represents A-grade land, rent of A-grade land is RSEP and output is OQ. Fig. (ii) represents B-grade land. Rent of B-grade land is ABEP which is less than A-grade land, output is OR which is also less than A-grade land because B-grade land is less fertile than A-grade land. Fig. (iii) represents C-grade land. Rent of C-grade land is CDEP and output is OS both rent of land and output is less than A-grade land as well as B-grade land because C-grade land is less fertile to both A-grade and B-grade lands. Fig. (iv) represents D-grade land whole total produce is equal to total cost hence this land does not pay rent. Its output is less than A-grade, B-grade and C-grade lands.

Ricardian theory of rent is based on the following assumption:

1. **Perfect Competition Among Tenants**

It is assumed that there is perfect competition among the tenants and hence, cost of production remains equal.

2. **Prior Knowledge of Fertility**

It is assumed that people have prior knowledge of fertility of land. They cultivated A-grade land first and then B-grade, C-grade and D-grade lands.

3. **Original and Indestructible Powers of the Soil**

Rent is only paid due to original and indestructible powers of the soil and not due to scarcity of land.

4. **Concept of Marginal Land**

It is assumed that there is a marginal land and rest of the three grades of lands pay rent according to this land and marginal land only covers its cost of production.

5. **Law of Diminishing Return Applies**

It is also assumed that law of diminishing return applies on produce of land.

CRITICISM

Ricardian theory of rent has been criticized on the following grounds:

1. Lack of Perfect Competition

It is assumed that perfect competition exists among the tenants but in practical life perfect competition neither exists in goods market nor in factors market.

2. No Prior Knowledge of Fertility

It is not right to assume that people have prior knowledge of fertility so they cultivate the most fertile land first, actually the fertility of land is known after cultivation.

3. Rent is not only due to Fertility

Fertility of land is not always remains the same. Fertile land may lose its fertility due to non attention while less fertile land becomes more fertile because of better facilities of irrigation and modern instruments of agriculture. Rent is not only paid due to fertility but it is also paid due to scarcity of land.

4. Vague Concept of Law of Diminishing Return

Theory of rent in based on the application of law of diminishing return but law of increasing return has been ignored. In modern world with the discovery of better techniques of production it has become possible to increase output and law of diminishing return can be postponed for a long period.

5. No Historical Proof

These is no historical proof that people first cultivated the most fertile land and then less fertile land. People cultivated that land first which was nearer to wells, rivers and water storage.

6. Does not explain the Determination of Rate of Rent

The theory only explains that more fertile lands pay more rent and less fertile land pays less rent but does not explain how rate of rent is determined.

7. Rent is included in Price

According to Ricardian theory of rent, Rent is separate from price while rent is included in price as wages of labour interest on capital and profits of entrepreneurs are included in price.

8. No need of Theory

Ricardian theory has been criticised by the modern economists that there was no need of rent theory as price of goods is determined through demand and supply, so rent is also determined by demand and supply.

TYPES OF RENT

1. Economic Rent or Pure Rent

It is the true surplus left meeting the expenses of cultivation as are represented by wages of labour, interest on capital and profits of enterprise or it is that payment which is paid to the landlord for the use of original and indestructible powers of the soil i.e., fertility of land.

2. Gross Rent

Sometimes land-lord provides extra facilities to the tenant alongwith land. If the rewards of these extra facilities are included in the pure or economic rent it becomes gross rent. Following payments are included in the gross rent besides pure rent:

(a) If the landlord has provided facilities of tube well, tractor and residence etc., to the tenants their rewards are included in the gross rent.

(b) If the landlord has employed a person to receive rent from tenant or maintains accounts himself, the wages of employee or his own services are included in the gross rent.

3. Differential Rent

We know that different pieces of land are different in fertility. Some pieces of land are more fertile while some are less fertile, more fertile land pays more rent and less fertile land pays less rent. Pieces of land also differ due to locality. Some pieces of land are nearer to market areas and urban areas and some pieces of land are far off from market areas and urban areas. Those pieces of land which are nearer to market areas and urban areas pay more rent while those pieces of land which are far off from market areas and urban areas pay less rent. Hence, surplus which is paid due to difference in fertility and locality is called differential rent.

4. Scarcity Rent

Scarcity refers to a situation when demand is more than the supply. According to some economists rent is not only paid due to the difference in fertility or locality but the main cause of paying rent is that demand for land being greater than its supply. The supply of land according to area is fixed. It can neither be increased nor decreased with an increase in population demand for land increases and supply of land remains the same that is why price of land increases and its rent increases i.e., Rent of land is a result of increase in demand than supply.

5. Quasi Rent

According to Alferd Marshall Quasi rent is "the surplus earned by the instruments of production other than land". Quasi rent is of temporary nature it is possible to earn only in the short period when demand for these instruments of production e.g. tractors, threshers, harvesting machines, Urea and sprays etc. increases in the short period than supply. Supply of these instruments of production in short run can only be increased upto the extent of increase in variable factors of production because of fixed factors of production can not be altered or substituted in short run hence, price of these instruments of production increases and the owners of these instruments of production earn extra income. This extra income is called Quasi Rent. In the long run quasi rent disappears because of increase in supply of these instruments of production because in long run not only the variable factors of product but also the fixed factors of production can be changed, altered or can be substituted. The basic difference in quasi rent and rent of land

is that quasi rent appears only in short period and it disappears in the long period while rent of land is both in the short period as well as in the long period. Rent is that produce of land which is paid to the landlord for the use of original and indestructible power of the soil or rent arises due to increase in demand than supply of land while quasi rent appears due to increase in price of instruments of production in the short period.

6. Transfer Earnings / Transfer Price

Transfer earnings represent the amount which a factor can earn in its next best paid alternative use. Suppose that a price of land in its present is Rs. 1,000 per acre of land and if this price of land is transferred to its next best paid alternative it yields Rs. 900 per acre of land. It yields Rs. 100 more than its present use than is next best alternative. Rs. 100 is surplus that the land is yielding in its present use. This surplus is called rent. It appears from the above that Rs. 900 is essential in order to retain this price of land but it yields Rs. 1,000 i.e., Rs. 100 more. The price which is necessary to retain a given unit of a factor of production in a certain industry may be called transfer earnings or transfer price.

7. Unearned Income

It is the surplus amount which is not a result of personal efforts. Sometimes price of land or property or of any factor increases due to Govt. policy. Suppose that Govt. announces a certain area as industrial area or tax free zone, price of that land will immediately increase because industrialists or business men find extra facilities e.g., tax holiday, tax reduction rail, roads, banking, credit facilities etc. Thus extra income earned without any effort is called unearned income. The concept of unearned income was given by Henry Georje. He advised the Govt. that this extra income should be taken away in the shape of taxes because it is not a result of personal effort.

8. Marginal Land or no Rent Land

That part of land which only covers its cost of production is called marginal land or no rent and all types of land pay rent according to marginal land.

MODERN THEORY OF RENT

According to modern economists rent of land is determined as price of commodity is determined by the equality of demand and supply.

DEMAND SIDE:

1. Demand for land is derived demand. If the demand for the produce of land increases, demand for land increases and if demand for produce of land decreases, demand for land decreases, while demand for goods is direct.
2. None of the factors of production can give produce alone hence, demand for land depends on the quantity and price of other factors of production. As one factor of production is sometimes substituted for the other hence reward of one factor of production affects the rewards of other factors of production.

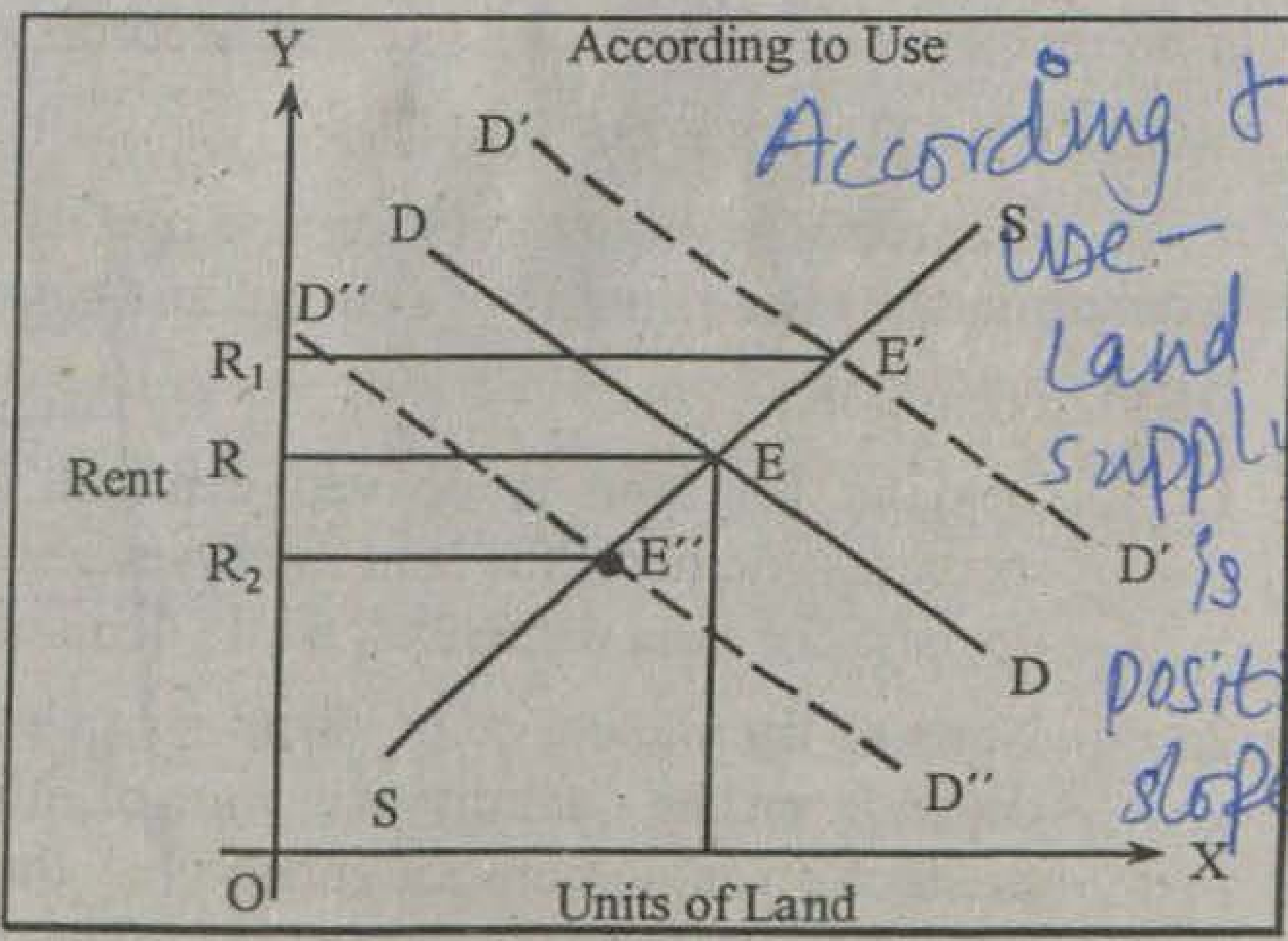
3. If the price of agricultural products increases, demand for land increases.
4. Demand for land depends on its marginal productivity, greater is the productivity greater is the demand and less is the productivity less is the demand for land.
5. Demand for land also depends on the technique of production. By the discovery of new and better means of production marginal productivity of land increases and as a result demand for land increases.
6. Demand for land depends on fertility. More is the fertility greater is the demand, less is the fertility lower is the demand.
7. Demand price of land also depends upon scarcity of land. More is the scarcity of land more is the rent less is the scarcity lower is the rent.
8. Demand for agricultural land depends on population growth rate, higher is the growth rate, higher is the demand for land and vice versa.
9. If the country is agrarian, demand for land is more and if the country is industrial then demand for agricultural land is less.
10. Demand for land also depends on the Govt. policy. If the agricultural policy is favourable demand for land increases and if government policy is such that it does not provide facilities to the farmers e.g., credit facility, crop insurance etc., demand for land decreases.

SUPPLY SIDE

Supply of land according to area is fixed and it can not be increased but supply of land according to particular use is not fixed. Suppose that wheat crop is profitable from rice, supply of land for wheat crop will increase while supply of land for rice decreases. Supply curve of land according to use is similar as of supply curve of commodity in the short period. Supply of land according to use varies directly with the rent of land.

Determination of Rent According to Use

Determination of rent according to use can be explained with the help of a diagram:

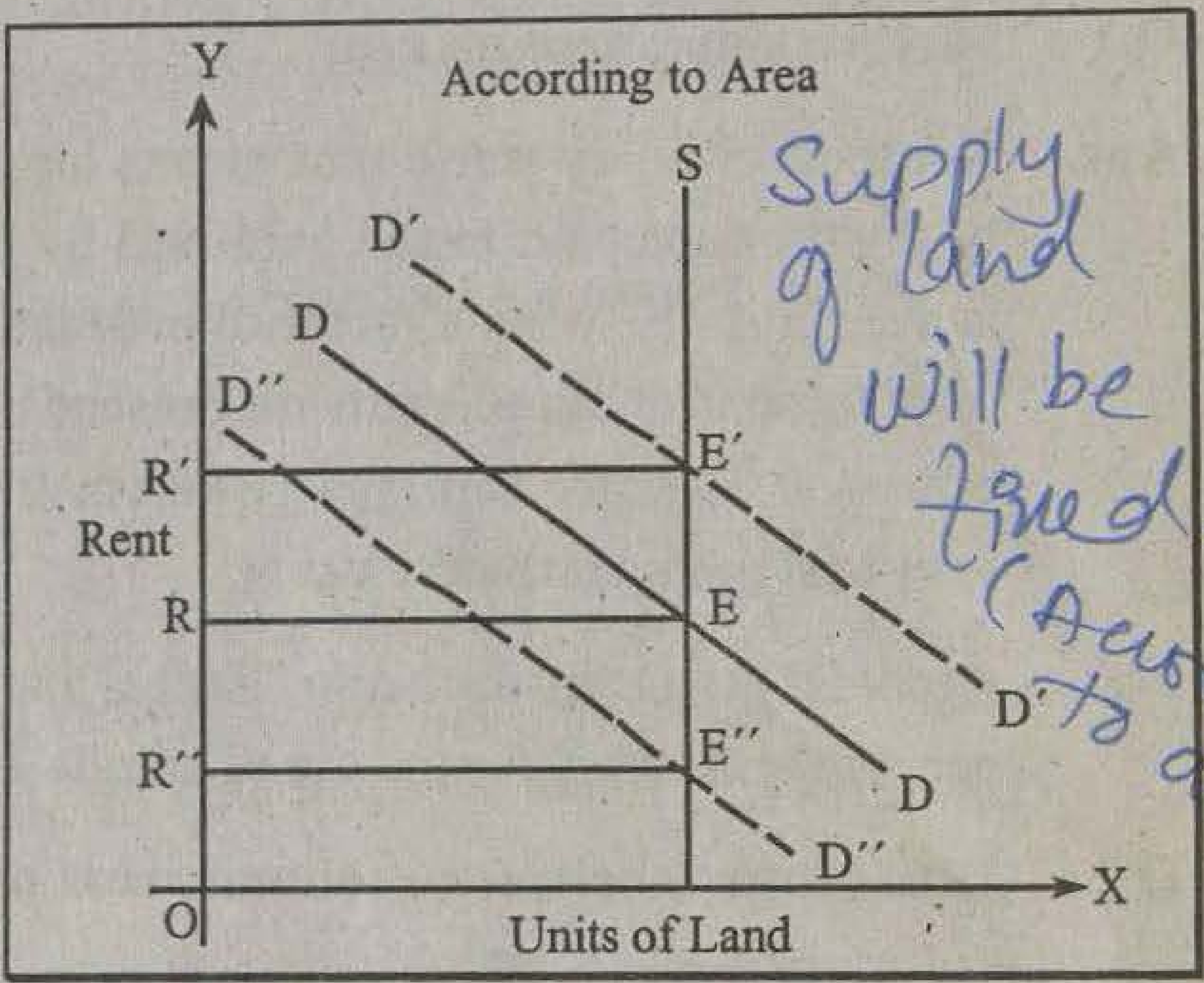


Quantity of land has been measured on x-axis and rent of land on y-axis. DD is the demand curve and SS supply curve. Demand curve and supply curve interest each other at point E hence, rent is OR. If demand for land increases to D′D′, rent of land will increase from OR to OR′$_1$ and if demand for land decreases to D′′D′′, rent of land will decrease to OR′′$_2$.

Determination of Rent according to Area

Rent of land according to area of land can be explained with the help of a diagram. Supply curve of land according to area is similar to supply curve of commodity in the short period.

Quantity of land is measured on x-axis and rent of land on y-axis. DD is the demand curve and SS is the supply curve. DD demand curve and SS curve intersect each other at point E hence, rent of land will determined as OR. If demand for land increases to D′D′ rent of land will increase to OR′ and if demand for land decreases to D″D″ rent of land will decrease to OR″.

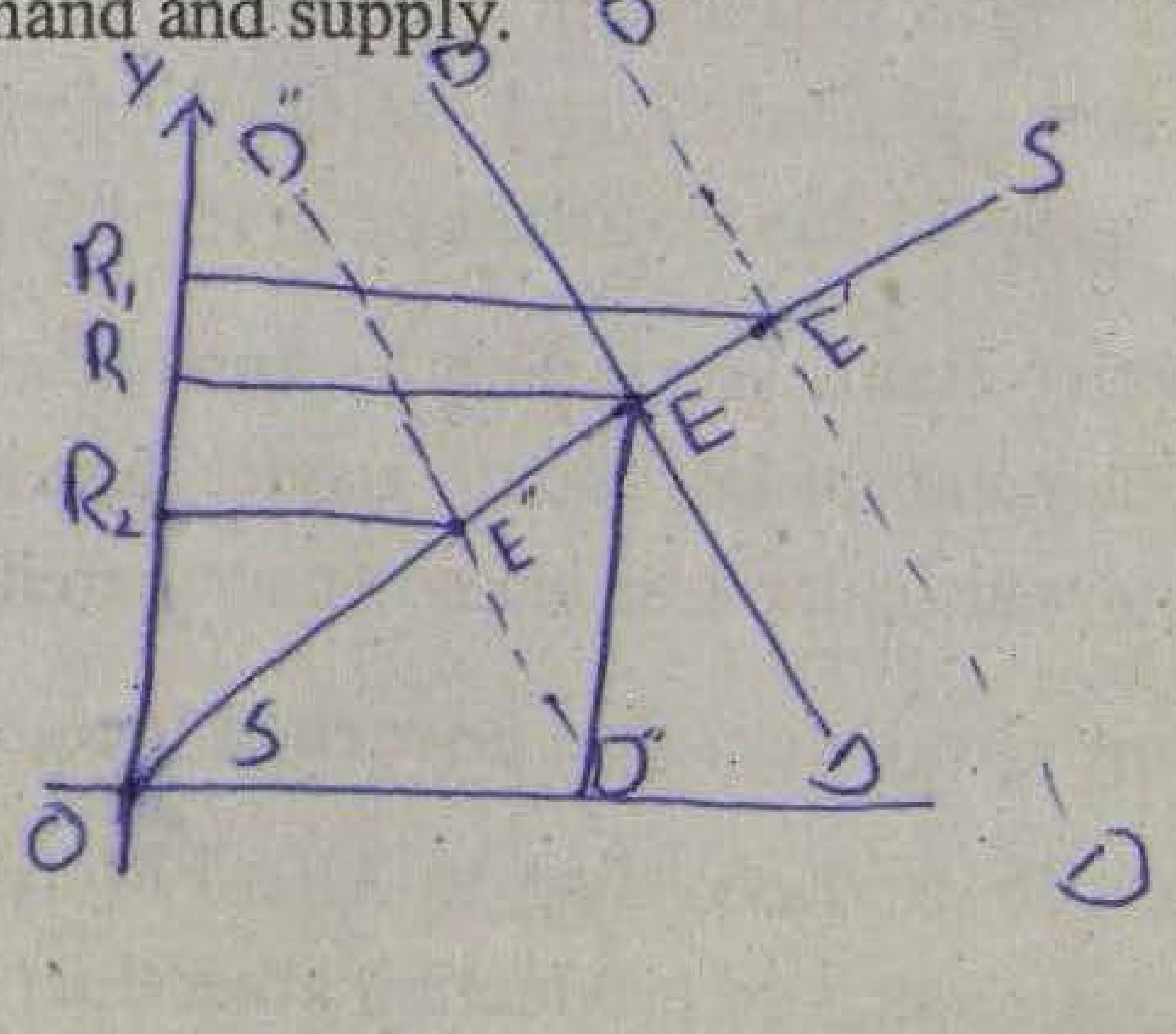


Superiority of Modern Theory over Ricardian Theory

According to Ricardian theory of rent, rent is that portion of produce of land which is paid to the land-lord for the use of original and indestructible powers of the soil". That is rent arises due to the fact that there is difference in different types of land. More fertile lands pay more rent and less fertile lands pay less rent. Other prominent fact of Ricardian theory is that there is a marginal or no rent land and all other types of lands pay rent according to this land. Ricardian theory has been criticized on both the grounds that rent is not only paid due to difference in fertility of land but also scarcity of land and that there is no marginal land, at present all types of lands pay rent. The theory has also been criticized on the grounds that it does not explain the determination of rate of rent but just explains that more fertile lands pay more rent and less fertile lands pay less rent.

In modern theory no such vague concept has been used. It has just explained that how the rate of rent is determined by demand and supply.

According to use
According to use
According to use



SHORT QUESTION ANSWER

Q.1 Write a short note on rent.

Ans. **Rent:** In ordinary sense rent means hiring charges but in Economics it is portion of the produce paid to the land-lord by the tenant for the use of land only, or rent is a surplus i.e., what a factor of production earns over and above what is essential to maintain its supplies in its present occupation or rent is excess over transfer earnings. Transfer earnings represent the amount which a factor can earn in the next best paid alternative use.

According to David Richardo "Rent is that portion of the produce of the earth which is paid to the landlord for the use of original and indestructible powers of the soil".

Q.2 Differentiate between economic rent or price rent and gross rent.

Ans. **Economic Rent or Pure Rent:** It is the true surplus left meeting the expenses of cultivation as are represented by wages of labour, interest on capital and profits of enterprise or it is that payment which is paid to the landlord for the use of original and indestructible powers of the soil i.e., fertility of land.

Gross Rent: Sometimes land-lord provides extra facilities to the tenant alongwith land. If the rewards of these extra facilities are included in the pure or economic rent it becomes gross rent.

Q.3 Define and differentiate differential rent and scarcity rent.

Ans. **Differential Rent:** We know that different pieces of land are different in fertility. Some pieces of land are more fertile while some are less fertile. Pieces of land also differ due to locality some pieces of land are nearer to market areas and urban areas and some pieces of land are far off from market areas and urban areas. Surplus which is paid due to difference in fertility and locality is called differential rent.

Scarcity Rent: According to some economists the main cause of paying rent is that demand for land being greater than its supply. The rent paid due to scarcity of land in particular area is known as scarcity rent.

Q.4 Define Quasi rent and unearned income.

Ans. **Quasi Rent:** According to Alferd Marshall Quasi rent is "the surplus earned by the instruments of production other than land". Quasi rent is of temporary nature it

is possible to earn only in the short period when demand for these instruments of production e.g. tractors, threshers, harvesting machines, Urea and sprays etc. increases in the short period than supply. This extra income is called Quasi Rent.

Unearned Income: It is the surplus amount which is not a result of personal efforts. Sometimes price of land or property or of any factor increases due to Govt. policy.

Q.5 Define marginal land or no rent land.

Ans. Marginal Land or no Rent Land: That part of land which only covers its cost of production is called marginal land or no rent and all types of land pay rent according to marginal land.

Q.6 What is mode theory of rent?

Ans. Modern Theory of Rent: According to modern theory rent of land is determined as price of commodity is determined by the equality of demand and supply.

EXERCISE

Q.1 What do you mean "rent" in Economics? Discuss critically the Richardian theory of rent.

OR

State and explain the Ricardian theory of rent. What modification have been made by modern writers.

OR

What is Ricardian theory of rent? Do you agree with the theory?

OR

Explain the Ricardian theory of rent with the help of diagram. On what grounds theory has been criticized.

OR

Rent is that portion of produce of the land which is paid to land-lord of the use of the original and indestructible powers of the soil". Discuss critically.

OR

Explain critically the classical theory of rent as given by Ricardo.

Q.2 Differentiate the following:

(a) Economics of Pure Rent and Gross Rent.
(b) Differential Rent, Scarcity Rent and Quasi Rent.
(c) Transfer earnings and unearned income.

OR

(a) Economic or Pure Rent	(b) Gross Rent
(c) Differential Rent	(d) Secarcity Rent
(e) Quasi Rent	(f) Transfer earnings
(g) Un-earneed Income	(h) Marginal land.

Q.3 Explain the modern theory of rent, and point out in what respect it is an improvement over the Ricardian theory of Rent. OR

What is Economic Rent? How is it determined? Explain fully. OR

"Rent as a price for the use of land, like all factors price, is determined by the demand and supply of land". Explain.

OR

Although land is not like a commodity yet its rent is determined just as the price as a commodity rent of land is determined under perfect competition.

✿ 9 ✿

CHAPTER 10

WAGES

Wages mean payments made for the services of labour, the services may be physical or mental or wages may be defined "as a sum of money paid under contract by an employer to a worker for services rendered", or payment due to ordinary employees, skilled or unskilled, is just "wages". These may be paid daily, weekly, or monthly or according to the work done. If wages are received on the basis of time, these are called time wages and if wages are received on the basis of work done these are called piece wages. Wages may be general or relative by general wages do not mean the general rate but the share of the national income claimed by labour as such, as against the other factors of production while relative wages refer to wages in relation to different employments and to different persons in the same employment.

NOMINAL WAGES AND REAL WAGES

Wages may also be classified as nominal wages and real wages. Nominal wages are wages paid or received in terms of money while real wages are equal to money wages plus the extra facilities and concessions earned by the workers or real wages are total benefits accruing to the worker. Welfare of the people, standard of living of the people and real happiness of the people depends on real wages. It is possible that money wages of a person are higher but he may be passing miserable life while another person who is receiving lower money wages but due to extra facilities, concessions and benefits, he may be passing luxurious life. Suppose that a person is receiving money wages equal to Rs. 4,600/= per month and he is unable to purchase basic necessities of life while another person who is also receiving Rs. 4,600/= per month but free medical facilities, free educational facilities for children, free residence and free transport facilities are available may be passing comfortable life. Although money wages are equal yet real wages of the person who is also receiving extra facilities are higher.

FACTORS DETERMINING REAL WAGES

1. Purchasing Power of Money

By purchasing power of money means that how much amount of goods can be purchased and services can be received with a unit of money. At a place or area where

unit of money can purchase more goods purchasing power of money is greater and where the same unit of money can purchase less quantity of goods, purchasing power of money is low. Purchasing power of money depends on the prevailing price. If prices are low purchasing power of money is greater. For example, purchasing power of money in rural area is more than the urban areas. Hence a unit of money can purchase more goods in a rural than in urban i.e., real wages in rural area are greater while low in urban areas.

2. Subsidiary Earnings

If an employee is earning extra money wages or getting facilities in addition to the regular money wages, his real wages will be more. Suppose that a person working as an electrician, his duty hours are from 8.00 A.M. to 2.00 P.M. and after 2.00 P.M. he works in his own shop and is earning extra income.

3. Extra Facilities and Concessions

Those employees who are receiving concessions like free medical facilities, free residential facilities, free educational facilities for their children and free transport facilities etc., their real wages are higher as against those employees who have not been provided with these facilities.

4. Extra Work without Extra Payment

Those employees who do not receive extra payment for extra work their real wages are low while those employees who receive extra payment for extra work. For example, if a peon in spite of services in the office also works in officer's houses and does not receive extra payment, real wages are low as against an employee who is receiving extra payment for extra work.

5. Conditions of Work

If the working conditions are healthier i.e., place of work is clean, ventilation is better, cold water was available in summer season, the working area is covered etc. real wages are more than those persons whose working conditions are not good.

6. Timings of Work

Greater are the working hours lower are the real wages. Fewer are the working hours greater are the real wages. For example, money wages of two employees are equal while one employee is working for 8 hours a day and other employee is working 7 hours a day. The real wages of the employee working 7 hours are high.

7. Nature of Work

If the job is easy and it does not affect health of the workers real wages are high but if the job is difficult and it affects health of the workers real wages are low e.g. a worker working in an office may be getting higher real wages as compared to worker who is working in a ternary, or in a textile mill etc.

8. Regularity or Irregularity of Work

If job is regular and more secured although money wages are low yet real wages will be higher than an employee whose job is neither secured nor it is regular e.g. a person employed in an ice factory where he is employed in summer season and is

unemployed in winter season, his real wages are lower than a person who is employed for whole the year and his job is secured.

9. Future Prospects

Those professions or jobs where future prospects of promotion or increase in income are brighter, real wages are higher than the jobs where future prospects are dark.

10. Relations between Employer and Employee

If the relations between employer and employee are good real wage of employee is higher because his efficiency increases and he will work with greater interest and this increases his money wages as well as real wages.

11. Expenditures of Profession

If the expenditures of profession are low, real wages are high and if the expenditures of profession are high real wages are low e.g., expenditure of profession of a lecturer are much less than the expenditures of profession of a doctor and an engineer but money wages of all the three are equal hence, real wages of a lecturer are higher than a doctor and an engineer.

12. Power

The employees who have more powers, real wages are higher than those employees who have less powers e.g., powers of a magistrate are more than a lecturer hence powers wise real wages of a magistrate are higher although duty hours are much more than a lecturer.

Powers of a magistrate

THEORIES OF WAGES

Several theories have been put forward to explain the general level of wages prevailed in the country. Some of the theories are the following:

(a) Subsistence Theory

The theory was originally advanced by the physiocrates and was developed by Adam Smith. According to this theory wages tend to settle at the level just sufficient to maintain the worker and his family at the minimum subsistence level. If wages level settles above the subsistence level, the workers are encouraged to marry and to have large families as a result, supply of labour will increase. The large supply of labour brings wages down to the subsistence level. If wages fall below the subsistence level marriages are discouraged, birth rate goes down due to under nourishment, death rate increases. Ultimately labour supply is decreased, until wages rise again to the subsistence level. German economist Lassalle called it "Iron law of Wages". Theory has been criticized on the following grounds:

CRITICISM

(i) It is not true to say that increase in wages encourages marriages and as a result birth rate increases. Some times people try to increase standard of living with an increase in wages instead of marriages.

(ii) The theory applies on those countries where majority of people are poor and standard of living is low but this does not apply in developed countries. The theory is based on "Malthusian theory of Population" and this theory itself does not prove true.

(iii) Theory does not explain that how wages are different in different occupations.

(iv) Theory does not explain fluctuations in wages.

(v) This theory explains that wages are determined at subsistence level while determination of subsistence level is impossible because price level fluctuates frequently.

(b) Wage Fund Theory

This theory was presented by J.S. Mill, According to this theory "Wages to the hired labour/workers are paid out of wage fund established separately by the firm or entrepreneur". Wages depend on two factors:

(a) The size of the wage fund

(b) The number of labourers.

Wages rate and wage fund are directly related while wage rate is inversely related with number of labourers/workers. It may be written as:

$$\text{Wage Rate} = \frac{\text{Wage Fund}}{\text{No. of labourers/workers}}$$

The theory explains that wages can neither be increased by an increase in wage fund or by decrease in number of labourers. According to this theory, steps taken by trade unions prove fruitful because if trade unions force to increases the wage rate, wage fund have to be increased with the condition that number of workers do not increase.

CRITICISM

(i) The theory is criticized that no separate wage fund is establish to pay wages. Wages are paid in similar fashion as rewards of other factors of production are paid.

(ii) It appears from this theory that efficiency of labourers is equal and hence equal wages should be paid but it is wrong.

(iii) If this theory was applicable, trade unions could not be able to increase the wage rate because unless and until wage fund is increased, wages could not be increased.

(iv) The theory ignores the demand side and relies only in supply side of labour.

(v) It does not explain the difference in wages in different employments.

(vi) In some countries where capital is short but wages are high.

(c) Residual Claimant Theory

The theory has been advanced by Prof. Walker. The theory explains "After Rent, interest and profit have been paid the remainder of the total output goes to the workers as wages". This theory was criticized on the following basis:

CRITICISM

(i) According to this theory after rent, interest and profits are paid remainder of total output goes to wages but the remainder is not wages but profits.

(ii) If the remainder is nothing labour will get nothing and if business is facing losses, labour will also face losses, but it does not happen in this world because wages are always predetermined.

(iii) The theory does not explain how trade unions are able to increase wages.

(iv) The theory does explain the affects of supply of labour on wages.

(v) The theory does not explain that why wages cannot be determined through demand and supply of labour as rewards of other factors are determined through their demand and supply.

(vi) It only considers demand side and ignores the supply side of labour.

(d) Marginal Productivity Theory of Wages

According to this theory "Wages of the workers tend to equal the marginal productivity of the labour". The theory has been criticized on the following grounds:

CRITICISIM

(i) Theory is based on the assumption that perfect competition exists in entrepreneurs and labour market. But conditions of perfect competitions are difficult to find in actual life.

(ii) It is assumed that efficiency of labour is equal which is impossible.

(iii) Theory assumes perfect mobility of labour which is also impossible.

(iv) Theory does not explain why wages are different at two places of the workers having same efficiency and skill.

(v) It is difficult to find marginal productivity of single factor of production because production is a result of combined efforts of all the factors of production.

(vi) Theory ignores supply side of labour.

(e) Modern Theory of Wages

This theory explains that as prices of goods are determined through the forces of demand and supply, wages are also determined through the forces of demand and supply. If supply of labour is more than demand wages will go down and if demand of labour is higher than the supply, wages will go up.

Modern theory of wage determination explains that "Although labour has certain particularities and can not be regarded ordinary commodity, still wages are largely determined by interaction of the forces of demand and supply". We analyse demand and supply of labour to explain this theory.

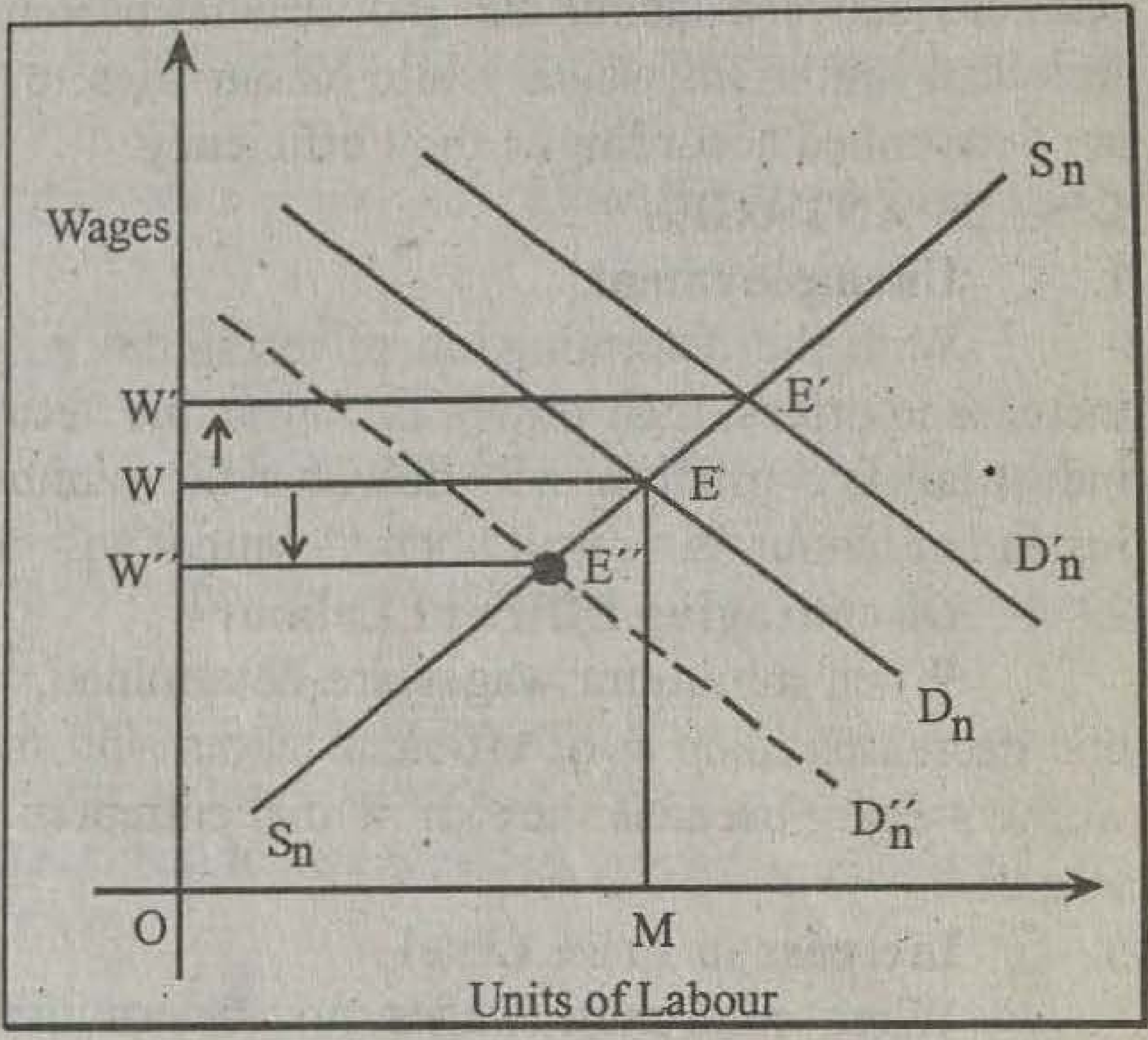
DEMAND FOR LABOUR

1. Demand for labour is indirect while demand for goods is direct i.e., demand for labour depends on the demand of goods which are produced with the help of labour. If demand for goods increases, demand for labour also increases and vice versa.
2. If the demand for goods in elastic, the demand for labour required to produce them will also be elastic and if demand for goods is less elastic; demand for labour will also be less elastic.
3. Demand price for labour depends upon the prices of the factors which have to be used with labour.
4. If the goods produced with the help of labour are costly i.e., high priced, demand price for labour is greater and vice versa.
5. Demand for labour depends upon their marginal productivity.
6. Demand for labour also depends on technology or techniques of production. If to a change in technology efficiency of labour increases, demand will increase and if to a change in technology demand for other factors of production increases, demand for labour will decrease.
7. If demand price of other factors of production increases and labour becomes cheaper, demand for labour will increase because labour intensive technique of production will be adopted by the entrepreneurs.

SUPPLY OF LABOUR

1. Supply of labour depends on the size of population. More is the population higher is the supply of labour, lower is the size of population lower is the supply of labour. If the share of women, children and old people is greater, supply of labour decreases.
2. Supply of labour depends on the social, cultural and political conditions.
3. Supply of labour also depends on conditions of work. If conditions or work are unfavourable supply of labour decreases.
4. Supply of labour depends upon the wage rate. If wage rate increases supply of labour increases and vice versa.
5. Supply of labour for a firm is elastic e.g., a firm can employ as much labour at prevailing rates as desired because supply of labour for a firm is negligible while supply of labour for a industry is not elastic because high wages will have to be offered for increased supply of labour.

Wage determination with the help of demand and supply can be explained with the help of diagram:



In the diagram Dn is the demand curve for labour and Sn is the supply curve of labour. Both demand and supply curve intersect each other at point at 'E' and OW will be the wage rate and OM number of labour will be employed. If demand for labour increases while supply of labour remaining the same as shown by Dn wage rate increases from OW to OW′ and if demand for labour decreases while supply of labour remaining the same as shown by Dn′′ wage rate will decrease to OW′′. If supply of labour increases while demand for labour remaining the same wage, rate will go down and supply of labour decreases while demand for labour remaining the same, wage rate will increases.

CONCEPT OF MINIMUM WAGES

The capitalists and producers exploits the labour when supply of labour is greater than its demand and pay wages less than their marginal productivity. To avoid exploitation of labour from capitalists and industrialists government determines minimum wages and to pay wages less than minimum wages rate is a legal offence.

While determining minimum wages efficiency of labour, general price level and nature of work is kept in view. This standard or level of a wages does not always remain the same. It changes with the changes in price level.

Advantages and disadvantages of minimum wages are given below:

MERITS/ADVANTAGES

1. No Exploitation

With the determination of minimum wages non of the industrialist/capitalist can exploit labour because they are bound to pay minimum wages. As the minimum wages are determined according to the marginal productivity of labour hence, labour cannot be exploited.

2. Suitable Standard of Living

While determining minimum wages, general price level is kept in view. Labour is able to purchase basic necessities of life with their minimum wages hence, they can keep suitable standard of living.

3. Increase in Efficiency

The minimum wages are determined according to the efficiency of labour so relations between labour and industrialist become good. Industrialists cannot pay wages less than minimum wages while labour tries to increase their efficiency because wages are determined according to their efficiency.

DISADVANTAGES

1. Unemployment

With the determination of minimum wages, cost of production increases and if increase in prices, their output is impossible because of danger of decrease in demand, the industrialists/capitalists will decrease the number of workers or start using machinery instead of labour as a result unemployment will be caused.

2. Discouraging Efficient Labour

When minimum wages are determined, wages paid to all workers are equal and this decreases interest of efficient labour. On the other side less efficient and dishonest workers enjoy because they know that entrepreneur cannot pay wages less than minimum wages.

3. Increase in Price Level

When minimum wages are determined, cost of production of entrepreneurs increases to cover extra cost of production. They increase the prices of their output and this burden is transferred to consumers.

4. Non-consistency of Minimum Wages

Standard of minimum wages cannot be maintained because of fluctuation in general price level and due to administrative reason level of minimum wages cannot be changed frequently.

5. Difficulty in Determining the Minimum Wages:

The factors which determine wages are always changing e.g., general price level is always changing, efficiency of labour in different industries and sectors is different and nature and conditions of work are different from industry to industry hence, a justifiable standard of minimum wages can not be maintained.

TRADE UNIONS

A trade union is an organization of labourers/workers whose aim is to make conditions of better work, attainment and security of rights of labourers/workers. Those organization not only try to bring material welfare but also work for increase in normal and social values or by improving conditions of work.

Supply of labour being more than their demand and due to lack of education, labourers/workers are not organized and united so capitalists and industrialists exploit them and pay wages less than their marginal productivity. To make conditions of work better and to make efforts to increase wages equal to marginal productivity, unity and organization is necessary and this becomes the main cause of the creation of trade union. OR trade union is a "Continuous association of wage earns for the purpose of maintaining or improving the conditions of their employment".

DUTIES AND OBJECTIVES OF TRADE UNIONS

1. Forcing the entrepreneur/capitalists to pay wages equal to marginal productivity of labour.
2. To make conditions of work better e.g., proper lightening, cross ventilation to avoid bad effects on worker's health.
3. Creation of unity among labourers/workers and strengthening their bargaining power.
4. To make arrangements for proper working hours.
5. Presenting demand of labourers/workers to management.
6. Providing financial assistance to unemployed workers during sudden demises and in case of accidents.
7. Strengthening the supply of labour i.e., pointing out those industries or sectors where demand for labour is greater.
8. Increasing the social and moral values e.g., hardworking and honesty etc.
9. Stopping unjustified dismissal of workers and reinstatements of dismissed workers.
10. Providing them medical, education and residential facilities (social securities).
11. To protect the interest of their members.

IN WHAT WAYS TRADE UNIONS CAN RAISE WAGES?

1. Raising wages equal to Marginal Revenue Product.
2. Increasing the marginal productivity of labour.

1. Generally entrepreneurs, industrialists and capitalists pay wages to labourers/workers less than their marginal revenue product. Trade unions can ensure that labour is paid to the full value of its marginal product. The conditions of perfect competition rarely exist in this world hence wages do not come up to the marginal product if bargaining power of labour is weak. But by strengthening the bargaining power of labour trade unions can raise wages upto the marginal product.
2. If the entrepreneurs are paying wages already equal to marginal productivity of labour following steps are taken to increase the marginal productivity of labour.
   (a) By forcing the employer to use modern machinery so that efficiency of labour increases.
   (b) By increasing moral values of labour e.g. honesty, hardworking, fostering habits of sobriety etc. and to get better education, training and skill.
   (c) Trade unions may increase marginal productivity of labour by restricting supply of labour.
   (d) By improving conditions of work in the factories.

So trade unions can raise wages either equal to marginal productivity or they can raise wages by increasing marginal productivity. However wages can be raised upto a limit and beyond that limit, it is impossible to raise wages because greater increase in wages may force the entrepreneur to use more capital than labour. If the elasticity of demand of goods produced is elastic, increase in wages becomes impossible because due to increase in prices (due to increase in cost of production) people will contact demand. Hence, it is concluded that trade unions can only increase wages upto a limit.

SHORT QUESTION ANSWER

Q.1 Define wages and differentiate nominal wages and real wages.

Ans. **Wages:** Wages mean payments made for the services of labour, the services may be physical or mental or wages may be defined "as a sum of money paid under contract by an employer to a worker for services rendered", or payment due to ordinary employees, skilled or unskilled, is just "wages".

Nominal Wages and Real Wages: Nominal wages are wages paid or received in terms of money while real wages are equal to money wages plus the extra facilities and concessions earned by the workers or real wages are total benefits accruing to the worker.

Q.2 What is subsistence theory of wages?

Ans. **Subsistence Theory of Wages:** According to this theory wages tend to settle at the level just sufficient to maintain the worker and his family at the minimum subsistence level.

Q.3 Describe wage find theory.

Ans. **Wage Fund Theory:** According to this theory "Wages to the hired labourers/workers are paid out of wage fund established separately by the firm or entrepreneur". Wages depend on two factors:

(a) The size of the wage fund

(b) The number of labourers

Wages rate and wage fund are directly related while wage rate is inversely related with number of labourers/workers. It may be written as:

$$\text{Wage Rate} = \frac{\text{Wage Fund}}{\text{No. of labourers/workers}}$$

Q.4 Describe residual claimant theory of wages.

Ans. **Residual Claimant Theory of Wages:** The theory explains "After Rent, interest and profit have been paid the remainder of the total output goes to the workers as wages".

Q.5 Describe marginal productivity theory of wage.

Ans. **Marginal Productivity Theory:** According to this theory "Wages of the workers tend to equal the marginal productivity of the labour".

Q.6 Describe modern theory of wages.

Ans. Modern Theory of Wages: Modern theory of wage determination explains that "Although labour has certain particularities and can not be regarded ordinary commodity, still wages are largely determined by interaction of the forces of demand and supply".

Q.7 Define the concept of minimum wages.

Ans. Concept of Minimum Wages: The capitalists and producers exploits the labour when supply of labour is greater than its demand and pay wages less than their marginal productivity. To avoid exploitation of labour from capitalists and industrialists government determines minimum wages and to pay wages less than minimum wages rate is a legal offence.

Q.8 Define a trade union.

Ans. Trade Unions: A trade union is an organization of labourers/workers whose aim is to make conditions of better work, attainment and security of rights of labourers/workers. Those organization not only try to bring material welfare but also work for increase in normal and social values or by improving conditions of work.

EXERCISE

Q.1 Explain the concept of wages, distinguish between normal wages and real wages. Explain the factors determining real wages.

OR

Distinguish between monetary wages and real wages/money wages and real wages/apparent wages and real wages/introducing wages and real wages. What are the determinants of real wages?

Q.2 Briefly explain the important theories of wage determination.

OR

Explain the following theories of wages:

(a) Subsistence theory (b) Wage fund theory

(c) Residual claimant theory

(d) Marginal productivity theory (e) Modern theory.

Q.3 Explain the modern theory of wages.

OR

"Wages determined through demand and supply of labour". Discuss.

OR

"Although labour has certain particularities and cannot be regarded as an ordinary commodity, still wages are largely determined by interaction of the force of demand and supply".

Q.4 Explain the concept of minimum wages. Give reasons in favour and against this theory.

OR

What are the advantages and disadvantages of minimum wages.

Q.5 What is trade union? What are the duties and objectives of trade unions? Can trade unions force increase wages as they want?

OR

How trade unions can increase wages? What duties they perform?

Q.6 What is the wage level in Pakistan? What are the problems of Industrial labour?

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CHAPTER

11

INTEREST

According to classical theory: (1) "Interest is a payment for the use of capital goods and it is necessary to induce people to save". (2) According to Keynsian theory "Interest is the price for surrendering liquidity preference". (3) According to loanable fund theory "Interest is the price paid for the loanable funds". Just as rent is a payment for the use of land, similarly interest is payment for the use of capital. (4) According to Marshall "Interest is the price paid for the use of capital in any market". (5) According to Paul A Samuelson "The market rate of interest is that percentage return per year which has to be paid on any safe loan of money, which has to be yielded by any safe bond or other type of security, and which has to be earned on the value of capital asset in any competitive market where there are no risk or where all risk factors have already been taken care of by special premium payments to protect against risk". OR reward of third factor of production (Capital) is called interest or interest in the reward for the use of capital or rate of interest is the price using capital for one year. It should be remembered that money is not purchased but its services are lent and borrowed. Capital may be in the shape of money or in the shape of plant and machinery or any other productive goods.

NET INTEREST/PURE INTEREST/ECONOMIC INTEREST

Pure interest is a payment only for the services of capital as such or for the money borrowed.

GROSS INTEREST

Gross interest is all that the borrower pays to the lender or it is the total amount which the debtor pays to the creditor. The following payments are included in pure interest, is called gross interest:

1. **Insurance against Risk**

Lenders of money receive some extra amount alongwith pure interest. This extra amount is due to the risk of non-receipt of pure interest. Risks borne by the lenders are of two types:

(a) ***Personal Risk***

Lender of money may fear that the borrower may refuse to pay back him money or interest on it.

(b) Trade Risk

Trade risks are due to the varying fortunes of business in which the money is invested.

2. Wages of Management

Gross interest may include wages of management. Owner of capital sometimes employ a person to keep record of amount lent and borrowed or to receive interest on capital.

3. Rent for Inconvenience

Lender of money loses command over his amount for a period. He is unable to use his amount since his money is locked up for a period. He receives interest on his amount. If this interest in included in the pure interest becomes gross interest.

Pure interest in different sectors is generally equal but gross interest in different sectors is different e.g., in agriculture rate of gross interest is greater while low in industry, because financial conditions of farmer are uncertain where as financial position of industrialists is strong.

Theory of interest are of two kinds:

1. Which explain why interest is paid
2. Which explain the determination of rate of interest.

1. THEORIES REGARDING PAYMENT OF INTEREST

(a) Productivity Theory of Interest

Followers of this theory said "That capital was productive of goods in the same sense as land was productive of goods of crops. They hold that interest was paid because production with the help of capital was greater than without it". The borrowers of money invest in productive jobs and then earn profits and if they were not provided credit they might have not earned profits because profit is just due to use of capital. Hence, lender has the right to receive a part of total profit and this is interest.

CRITICISM

(i) Capital alone is not Productive

Theory was criticised on the ground that capital is not alone productive. Production is impossible without the combination of other factors of production i.e., land, labour and entrepreneur.

(ii) Why Interest on Loans for Consumption Purposes

If capital is productive then why interest is received on unproductive purpose e.g. loans for consumption purpose.

(iii) Why Interest on Losses

It was criticized that if interest is a part of profit then why interest is received when business faces loss.

(b) Abstinence or Waiting Theory of Interest

Theory was advanced by N.W. Senior. According to him". Saving involved a sacrifice or "Abstinence" saving was an act of abstaining from consumption. Since to abstain was painful, it was necessary to reward people for this act. This reward was in the form of the interest paid to those who saved rather than consumed their incomes or a part of this income.

CRITICISM

(i) No Waiting or Abstinence

It was criticized that those persons who lend money have excess income and they do not wait or abstain from lenders of capital are always rich class hence, they neither wait nor abstain from.

(ii) Ignoring the Demand Side

Theory only considers supply side of capital and does not explain the forces of demand.

(c) Time Preference Theory

The theory was propounded by Fisher. According to him "Individual prefers present satisfactions to equally certain future satisfaction. They are thus impatient to spend their incomes now" the degree of impatience depends upon the size of incomes, the distribution over time, the degree of certainty regarding employment in the future and the temperament and the character of individuals.

CRITICISM

(i) Unrealistic Assumption

All human efforts are to brighten future and saving are made for future so that to face uncertain conditions and unexpected incidents of future.

(ii) Reason is not Correct

According to this theory lender of money or capital receives price of present in future but when lender is receiving amount lent plus interest he is receiving price of past in present.

2. THEORIES REGARDING DETERMINATION OF INTEREST

(a) Lonable Funds Theory

According to loanable funds theory, interest is the price paid for the use of lonable funds. It asserts that rate of interest is determined by the equilibrium between demand and supply of loanable funds in the credit market.

The demand for loanable funds come from (i) Households, (ii) Firms, (iii) Public authorities or government. The supply of loanable funds come from (i) Households, (ii) Firms, (iii) Banks.

(b) Keynesian Theory of Interest or Liquidity Preference Theory

According to Keynes "The rate of interest is a reward for parting with liquidity or interest is determined by demand for money as the supply of money remains unchanged in the short period". Keynesian theory of interest is only for the short period and is silent in the long period.

CRITICISM

(i) Rate of Interest is not Purely a Monetary Phenomenon

It was criticized that rate of interest is not purely a monetary phenomenon. It ignores the real forces like productivity of capital, savings which play important role in determining rate of interest.

(ii) Rate of Interest is not Independent of Demand for Investment Funds

According to Keynes rate of interest is independent of demand for investment while rate of interest is not determined independently. It depends upon marginal efficiency of capital and expected yields.

(iii) Interest is not only due to Liquidity

Interest is not paid due to liquidity only but interest is paid because borrowers earn profits from capital and they pay part of that profit to lenders of money.

(iv) Ignoring supply of Money

Only demand for money has been considered while supply of money has been assumed fixed in the short period.

(v) Different Rates of Interest

The theory does not explain why different rates of interest prevail in capital market at one time.

(vi) Only for Short Period

Theory explains determination of rate of interest only in short period but it is silent in the long period.

(vii) Ignoring M.E.C. and Expected Yields

Keynes ignored marginal efficiency of capital (M.E.C.) and expected yield which play very important role in the determination of rate of interest.

(viii) According to Keynes rate of interest is determined through speculative demand. But it is difficult to know the supply of money which will be sufficient to meet the speculative demand and which will be sufficient to meet demand for transactory and precautionary motives unless we know the level of income.

LIQUIDITY PREFRENCE THEORY

The concept of liquidity preference was presented by Lord Keynes. According to him people spend a portion of total income according to propensity to consume and the income according to propensity to save which is saved, they decide how much of their saved income should be kept in liquid form and how much should be lent. For this we have to see why people prefer liquidity.

Liquidity preference means "The demand for money to hold or the desire of the public to hold cash. Liquidity preference depends on several motives:

(a) Transaction Motives

(b) Precautionary Motives

(c) Speculative Motives.

(a) Transaction Motives

It is the demand for or the need to hold cash for the current transactions of individuals and business exchange. The desire to hold cash or money by the individuals may be seen in two ways:

(i) According to the consumers

(ii) According to the entrepreneurs

(i) Individuals hold cash in order "to bridge the interval between the receipt of income and its expenditure". The demand for money to hold cash depends upon the level of income and the interval of income. If the level of income is high, demand for money for transaction motives will be greater and if the level of income is low demand is low for money for transaction motives. If the interval of income is short, demand for money for transaction motive is low and higher is the interval of income, greater is the demand for money.

(ii) The business and the traders also have to keep a portion of their income in ready cash in order to meet current needs e.g. to purchase raw material, transport and communication expenses etc.

(b) Precautionary Motives

Consumers as well as businessmen hold money or cash in order to meet unexpected needs or unforeseen contingencies e.g., danger of unemployment, sickness, accidents and other more uncertainties. The demand for money for precautionary motives also depends upon the level of income. Higher is the income greater is the demand for precautionary motives and lower is the income lower is the demand for precautionary motives.

(c) Speculative Motives

The demand for money for speculative motives depends upon the future changes in the rate of interest. The speculative motives relates to the desire to hold one's resources in liquid form in order to the future changes in the rate of interest or bond price. The cash held under this motive is used to make speculative gains by dealing in bonds whose prices fluctuate. If bond prices are expected to rise i.e., rate or interest is expected to fall, businessmen will buy bonds to sell when the price actually rises and if bond price is expected to fall i.e., rate of interest is expected to rise, businessmen will sell bonds to avoid capital losses.

The demand for money under speculative motives is a function of the current rate of interest. Demand for money under speculative motives varies inversely with current rate of interest. Higher is the rate of interest lower is the demand for speculative motives, lower is the rate of interest higher is the demand for speculative motives.

Determination of Rate of Interest

According to Keynes rate of interest is determined through demand for money (Liquidity preference) and the supply of money. Demand for money means demand for speculative motives which varies inversely with the current rate of interest. Supply of money consists of coins, currency notes and Bank notes. Supply of money in the short period remains the same because the supply of money determined by policies of the government and the Central Bank of the country and in the short period these policies do not change hence supply of money remains constant.

The demand for speculative motives can be explained with the help of a diagrams:

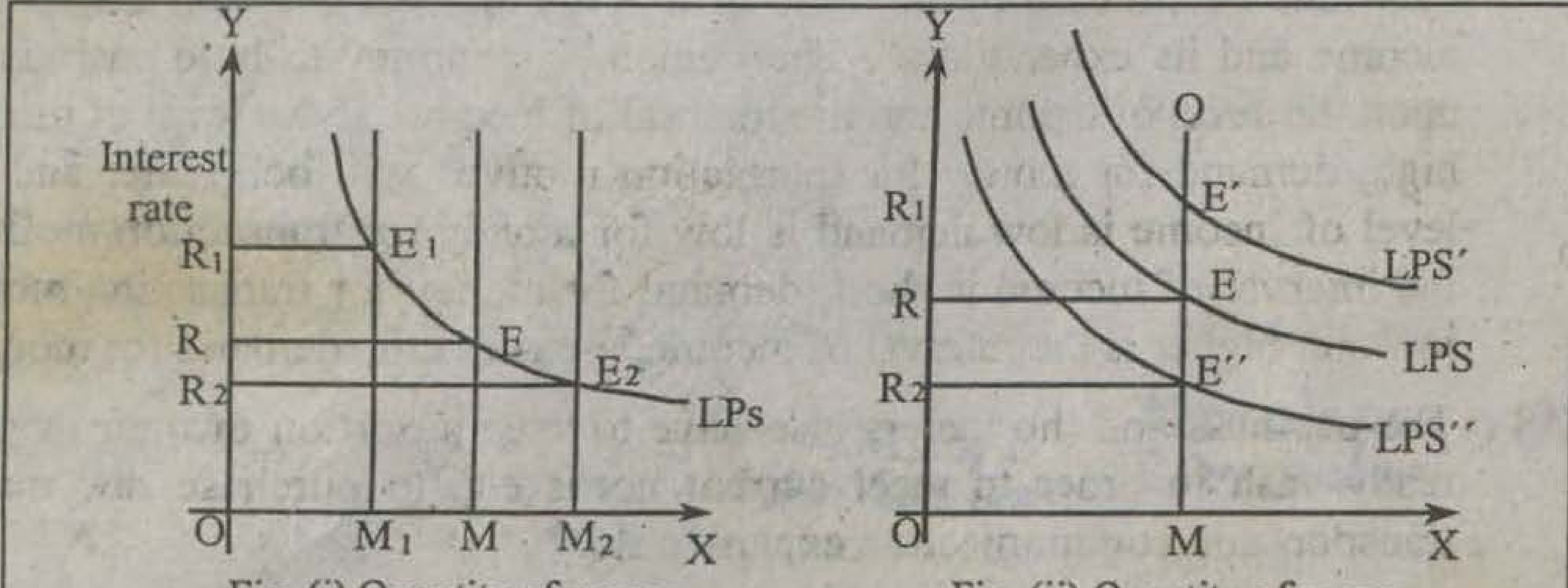


Fig. (i) Quantity of money | Fig. (ii) Quantity of money

In Fig. 1 LPs is the demand curve for speculative motive. Amount of money is measured on x-axis and rate of interest on y-axis when supply of money is OM_2 which is available for satisfying liquidity preference for speculative motives rate of interest will be OR_2. Because supply of money is equal to demand for money and if supply of money decreases to OM_1, rate of interest will increases from or to OR_1, because now less amount of money is available for satisfying liquidity preference for speculative motives rate of interest will be OR_1 as the supply of money is just balance with demand for money. In Fig. 2 amount of money is OM and rate of interest is OR. If demand for speculative motives increases from LPS to LPS′. Rate of interest increases from OR to OR_1 because the supply of money has become short of demand. Rate of interest will be determined at OR_1 where demand for money is equal to supply of money and if demand for speculative motives decreases to LPS′′. Rate of interest will be OR_2 where demand for money is equal to supply of money. Thus, according to Keynes Rate of interest is mainly determined by the liquidity preference (demand for money) instead of supply of money in the short period.

EXERCISE

Q.1 Distinguish between gross interest and net interest. Analyse gross interest to its various constituents.

Q.2 Why interest is paid?

OR

What are the different theories of rate of interest? Explain theories of interest?

OR

Is payment of interest is justified?

Q.3 Explain the liquidity preference of interest.

OR

What are the different motives for holding money? Explain how the demand for holding money may influence the rate of interest.

OR

Explain the concept of liquidity preference. What part does it play in the determination of rate of interest?

OR

The demand for money is always the demand for money to hold.

OR

What is meant by speculative demand for money? What role does it play in determining the rate of interest?

OR

Explain the Keysian theory of interest with the help of a diagram.

OR

Explain briefly the liquidity preference theory of interest. How far is the theory satisfactory in explaining the determination of rate of interest.

OR

"Interest is the reward for parting with liquidity". Discuss.

OR

"The rate of interest is the price of money and is determined by the demand and supply of money".

CHAPTER 12

PROFIT

Profit is an income earned by an entrepreneur for his entrepreneurship and abilities or if rent of land, interest on capital and wages of labourer are deduced from National Income, the residual is profit.

The profits of entrepreneur are different from the rewards of other factors of production because:

(a) Profit is a residual and it is not predetermined while rewards of other factors of production are predetermined.

(b) The fluctuations in profits are frequent while rewards of other factors normally changes after a certain period.

(c) Profits can be negative while rent, interest and wages can never be negative that is entrepreneur face losses.

In ordinary sense profit is the surplus of income over expenses of production accuring to a businessman. It is the amount left with after he has made payments for all factor service used by him in the process of production. But he may not have been careful in calculating all such expenses of production in the economic sense of two types.

(A) NET PROFIT AND ELEMENTS OF NET PROFIT

Net, true, economic or pure profit is the residue left to the entrepreneur after deducting all the items enumerated e.g. rent on land, interest on capital wages of management deprecation charges and insurance charges. Net profit however, includes, the following elements within it.

1. Reward of Uncertainty Bearing

Pure profit which an entrepreneur receives is the reward for bearing uninsurable risks and uncertainties.

2. Reward for Coordination of Factor of Production

An entrepreneur who combines factors of production (FOP) in the optimum way is able to produce larger quantities of product with the minimum of cost and this earns larger amount of profits.

3. Rent of Ability

An entrepreneur with a superior business method is able to earn larger profit than others.

4. Reward of Innovation

Reward of innovations are also included in pure profit. An entrepreneur who innovates by bringing out a new product or technique of production earns higher profits.

5. Monopoly Gains

If an entrepreneur gains the position of a monopolist he earns super normal profit.

6. Windfall Gains

Pure profit earned by an entrepreneur may also include chance profit e.g., increase in demand because of out break of war of closing down of some other firms.

(B) GROSS PROFITS OR ACCOUNT PROFITS = SALES REVENUE – EXPLICIT COST

Total profits earned by an entrepreneur by deducting total cost from total revenue are gross profits. Gross profits include the following:

1. Rent of his on Land

The businessman may have used his own land for erecting the factory so that he may be saved of the botheration of paying rent to some other landlord. This rent is included in his profits. This is implicit or imputed rent which is not a part of his profit. Had he hired land from some other person, he would have paid its rent? In calculating net profit, implicit rent should be deducted from gross profit.

2. Interest on Capital

Similarly he may have used his own capital in his business in order to avoid the inconvenience of borrowing from some other person. The implicit interest is again included in his gross profit. If he had borrowed the same amount of capital for investment in his business, he would have paid interest on it. This interest should, therefore, be subtracted from his gross profit to arrive at net profit.

3. Wages of Management

The businessman may have been busy in organising, coordinating and managing the entire business himself. But he may have been contented with income received after meeting all expenses of production. If he had not performed the work of management himself he would have employed a manager to whom he would have paid wages. Thus his gross profit includes implicit wages which are required to be deducted for calculating net profits. In all joint stock companies, profits are received by share-holders; the manager and the managing directors are all salaried person whose salaries are included in the expenses of the firm.

4. **Depreciation Charges**

Expenses incurred on repair and replacement of machinery are a part of the cost of production. Therefore, these should have been excluded for the purpose of having net profits.

5. **Insurance Charges**

Insurance charges which are paid as a premium annually against fire, accidents and losses of other kinds by a firm are added to gross profits.

6. **Net Profit**

It is the residue left to the entrepreneur after payments of rent, wages and interest. Net profit includes reward of uncertainty bearing, reward for coordination, rent of ability, reward of innovation, monopoly gains and windfall gains.

Accounting profits = Total sale revenue

(–) Explicit cost e.g. wages of labour, raw material cost etc.

Economic Profit= Total sales revenue

(–) Explicit cost (–) Implicit cost (OR)

Economic Profits = Accounting Profits

(–) Implicit cost (rent of owner's land, interest of owners, capital, wages of his own labour etc., are known as implicit cost).

THEORIES OF PROFIT

The Uncertainty-Bearing Theory

Prof. Frnak H. Knight regards profits as the reward of bearing non-insurable risks and uncertainties. He distinguishes between insurable and non-insurable risks. Certain risk are measurable as much as the probability of their occurrence can be statistically calculated. The risks of fire, the risks of merchandise and of death by accident are insurable. Such risks are borne by the insurance company. There are certain unique risks which are incalculable. The probability of their occurrence cannot be statistically computed because of the presence of uncertainty in them. Such unforeseen risks relate to changes in prices, demand, supply etc. No insurance company can calculate the loss expected from such risks, and hence they are non-insurable. Profit, according to Knight, is the reward of bearing non-insurable risks and uncertainties.

CRITICISM

Knight's theory of profit elaborate more than the other theories, because it combines the concept of risk of economic change and of the role of business ability. But it has its weaknesses.

1. Entrepreneur Ship and Control

It does not include a clear notion of entrepreneur ship. His sole function is regarded as one of uncertainty - bearing. But in modern business corporations ownership is separate from control. Decision-making is done by the salaried managers who control and organise the entire corporation, whereas ownership results with shareholders who ultimately bear uncertainties of business. Knight does not separate the two and his theory becomes unrealistic.

2. Problem of Distribution of Profit

The theory does not solve the problem of allocation or distribution of profit among the controlling and ownership groups of the corporation and thus keeps the problem of the determination of profit unsolved.

3. Measuring Uncertainty Bearing

Knight himself finds little empirical evidence to measure uncertainty - bearing to arrive at the quantum of profit accuring to a firm. Thus uncertainty - bearing explains the emergence of profit in a vague manner.

4. Changes in Population and Capital are Unpredictable

Knight's assertion that changes in population and capital are predictable, is true only if we are dealing with the economy as a whole. But his study of profit is related to a business firm for which changes in population and capital are unpredictable. And in terms of Knight's theory they can also lead to positive or negative profit.

5. Residual Income

Knight's view that profit is a residual income which accrues to the entrepreneur on the basis of his judgment, has also been criticised. According to J.F. Weston, the "ultimate decision-makers in a firm need not be compensated as residual income receivers.

6. Uncertainty bearing is not a separate factor of Production

Uncertainty - bearing cannot be looked upon as a separate factor of production like land, labour or capital. It is a psychological concept which forms part of the real cost of production. But the supply of a factor service, much less of entrepreneurial ability, depends on its opportunity cost rather than on real cost.

7. Monopoly Profits

This theory throws no light on monopoly profit. Monopoly firms earn much larger profits than competitive firms and they are not due to the presence of uncertainty.

Despite these weaknesses, the uncertainty-bearing theory of knight is regarded as the only satisfactory explanation of the nature profit.

THE MARGINAL PRODUCTIVITY THEORY OF PROFIT

The determination of the renumeration of the entrepreneur, like any other factor, is sought to be explained in terms of its marginal revenue productivity. Edgeworth, Champman, Stigler and recently Stonier and Hague have explained the determination of profit with the help of this theory. According to this theory, profit as the reward of an entrepreneur is determined by its marginal revenue productivity. The higher the marginal revenue productivity, the higher are the profits, and the lower the marginal revenue productivity, the lower are the profits of an entrepreneur.

CRITICISM

The marginal productivity theory of profit is not free from criticism.

1. **MRP of entrepreneurship is meaning less**

Like land, labour or capital, the marginal revenue productivity of entrepreneurship is a meaningless concept in the case of a firm because, unlike other factors, there can be only one entrepreneur in a firm.

2. **Entrepreneurs differ in efficiency**

The theory is based on the unrealistic assumption of the homogeneity of entrepreneur in an industry. It is, therefore, not possible to have same marginal revenue productivity curve for all entrepreneurs. The theory thus fails to determine profit accurately.

3. **Rent of ability**

Since entrepreneurs differ in efficiency all cannot earn only normal profits. Entrepreneurs with greater efficiency than others would be earning more than normal profits. This will be the rent of ability which will be included in the profits earned by them. This theory throws no light on this aspect.

4. **Windfall gains**

The theory fails to explain why entrepreneurs sometimes earn windfall or chance gains and even monopoly profits.

5. **A Static theory**

It is essential a static theory according to which all entrepreneurs earn only normal profits in the long-run. The real world is, however, dynamic in which some entrepreneurs run more than normal profits.

6. **One sided theory**

It is one-sided theory which takes into account only the demand for entrepreneurs and neglects the supply of entrepreneurs.

SHORT QUESTION ANSWER

Q.1 Define profit and how it differs from rewards of other factors of production.

Ans. **Profit:** Profit is an income earned by an entrepreneur for his entrepreneurship and abilities.

The profits of entrepreneur are different from the rewards of other factors of production because:

(a) Profit is a residual and it is not predetermined while rewards of other factors of production are predetermined.

(b) The fluctuations in profits are frequent while rewards of other factors normally changes after a certain period.

(c) Profits can be negative while rent, interest and wages can never be negative that is entrepreneur face losses.

Q.2 Define and differentiate net profit and gross profit.

Ans. **Net Profit:** Net, true, economic or pure profit is the residue left to the entrepreneur after deducting all the items enumerated e.g., rent on land, interest on capital wages of management deprecation charges and insurance charges.

Gross Profits: Total profits earned by an entrepreneur by deducting total cost from total revenue are gross profits. Gross profits include the following:

1. Rent of his own Land
2. Interest on Capital
3. Wages of Management
4. Depreciation Charges
5. Insurance Charges
6. Net Profit

Q.3 Define normal profits.

Ans. **Normal Profit:** Normal profit is the opportunity cost of entrepreneurship, because it is the amount of profit than an entrepreneur could earn elsewhere, therefore it is the profit that he must earn to induce him to continue with his investment in his current enterprise.

OR

It is the minimum profit which an entrepreneur should earn or when there is no tendency of a new firm to enter in a production process and the old firm do not exit from the production process it is said that firm are earning normal profits.

Q.4 Define and differentiate accounting profit and economic profits.

Ans. **Accounting Profits:** Consists of sales revenue minus the explicit costs of the business.

Economic Profits: Consists of total sales revenue minus explicit costs and implicit costs of production or business.

Q.5 Define and differentiate explicit costs and implicit costs.

Ans. **Explicit Costs:** Explicit costs are cleary stated and recorded e.g., materials costs, labour costs (wages) depreciation costs and rents of land and building etc.

Implicit Costs: Implicit costs are the benefits foregone by not using the factors of production in their next best alternative profitable way.

Q.6 Define minimum efficient scale (MES).

Ans. **Minimum Efficient Scale:** It is the minimum scale of production in any industry which is necessary for a firm to reap the economies of scale.

Q.7 Define wage differentially.

Ans. **Wage Differentials:** Wage differentials are the differences in the rate of wage between one type of job and another.

Q.8 What is a collective bargaining?

Ans. **Collective Bargaining:** Collective bargaining refers to the process by which trade uncons negrtiate and reach agreements with employers.

Q.9 Define labour productivity. What factors may influence labour productivity?

Ans. **Labour Productivity:** It is the output per worker over a given period of time and is indicated by average product of labour.

Factors Influencing Labour Productivity:

(i) The quality of the labour.

(ii) The ratio of other factors of production with labour.

(iii) Remuneration of employees.

(iv) Working conditions.

(v) Economies of the scale.

Q.10 Differentiate risk and uncertainty.

Ans. **Risk and Uncertainty:** Risk and uncertainty involves situations or events which may or may not occur but the probability of occurrence can be calculated statistically i.e., risk is insurable. Uncertainty is cannot be predicted statistically and therefore is not insurable.

Q.11 What is a risk premium?

Ans. **Risk Premium:** Risk premium is the additional return in excess of a risk free return needed to compensate an investor for involving in risky investment.

Q.12 Differentiate between transfer earning and economic rent.

Ans. **Transfer Earnings and Economic Rent:** Transfer earnings are the reward the factor of production would receive in its next best employment is its opportunity cost. Economic rent is the difference between its transfer earnings and its actual reward for its existing use i.e., it is the surplus above the transfer earnings.

EXERCISE

Q.1 Define profit and differentiate between pure profit and gross profit.

Q.2 Define and explain Prof. Knight's uncertainty bearing theory of profits critically examines Knight's theory of profits.

Q.3 Critically examine marginal productivity theory of profits.

Q.4 Given the following statistical data of an entrepreneur.

Total Revenue	Rs. 360,000
Cost of Production	Rs. 125,000
Hired Labour cost	Rs. 75,000
Depreciation	Rs. 35,000
Rent of his own building	Rs. 15,000
Interest of his own capital	Rs. 10,000
Salaries as manager	Rs. 75,000

(a) Find Gross Profit and (A/c profits)

(b) Economic profits

Ans: $\begin{Bmatrix} \text{Gross Profits} = \text{Rs. } 125{,}000 \\ \text{Economic Profit} = \text{Rs. } 25{,}000 \end{Bmatrix}$

✿ ❶❷ ✿

MACRO ECONOMIC ENVIRONMENT

1) GDP = Gross Domestic product
GNP = Gross National product

$GDP = C + I + G + (X - M)$

C = consumption expenditures
I = Domestic investment / Private
G = Govt expenditures
X = export M = import

(X - M) = Net export

2) NDP Net domestic Product
NNP Net National Product
GDP = GDP - Depriciation Cost

GDP = GNP - net income from abroad

GNP is the total measure of goods and services at m

Concept of N.I
1) GNP or GDP
② NNP = GNP = depreciation cost
③ N.I = national income
④ N.I = NNP + subsides - indirect taxes

CHAPTER 13

NATIONAL INCOME CONCEPTS AND MEASUREMENT

NATIONAL INCOME

National Income is an uncertain term which is used interchangeably with national dividend, national output and national expenditure. On this basis National Income has been defined in a number of ways. The definitions of National Income can be grouped into two classes. One the traditional definitions and second the modern definitions.

1. The Marshallian Definition

According to Marshall: the labour and capital of a country acting on its natural resources produce annually a certain net aggregate of commodities, material and non-material including services of all kinds. This is the true "net annual income or revenue of the country or national dividend".

2. Modern Definition

From the modern point of view, Simon Kuznets has defined national income as "The net output of commodities and services following during the year from the country's productive system in the hands of ultimate consumers, whereas in one of the report of United Nations, national income has been defined on the basis of the systems of estimating national income, as net national product, as addition to the shares of different factors, and as net national expenditure in a country in a year's time.

OR

National Income can be defined as equal to Gross National Product (–) Depreciation allowances (–) Indirect Taxes (+) subsidies or National Income is equal to Net National Product (–) Indirect taxes (+) subsidies or N.I. = GNP – Depreciation allowances – Indirect taxes + subsidies.

OR

N.I. = N.N.P. – Indirect Taxes + Subsidies.

CONCEPTS OF NATIONAL INCOME

There are a number of concepts pertaining to national income. For instance, Gross national Product, Net National Product, Net National Income at Factor Cost, Net Domestic Product at Factor Cost, Personal Income, Disposable Income, and Real Income. One by one, these concepts are discussed below:

1. Gross National Product (GNP)

GNP is the total measure of the flow of goods and services at market value resulting from current production during a year in a country, including net income from abroad. GNP includes four types of final goods and services:

1. Consumers' goods and services to satisfy the immediate wants of the people.
2. Gross private domestic investment in capital goods consisting of fixed capital formation, residential construction and inventories of finished and unfinished goods.
3. Goods and services produced by the government.
4. Net export of goods and services, i.e., the difference between value of exports and imports of goods and services, known as net income from abroad. Net property incomes from abroad are added in G.NP only.

In this concept of GNP, there are certain factors that have to "be taken into consideration. First, GNP is the measure of money, in which all kinds of goods and services produced in a country during one year are measured in terms of money at current prices and then added together. But in this manner, due to an increase or decrease in the prices, GNP shows a rise or decline, which may not be real. To guard against error on this account, a particular year (say for instance 2004) when prices be normal, is taken as base year and the GNP is adjusted in accordance with the index number for that year. This will be known as GNP at 2004 prices or at constant prices.

Second, in estimating GNP of the economy, the market price of only the final products should be taken into account. Many of the products pass through a number of stages before these are ultimately consumed by the consumers. If those products were counted at every stage, they would be included many a time in the national product and consequently the GNP would increase too much. To avoid double counting, therefore, only the final products, and not the intermediary goods should be taken into account.

Third, goods and services rendered free of charge are not included in GNP because it is not possible to have a correct estimate of their market prices.

Fourth, the transactions which do not arise from the produce of current year or which do not contribute in any way to production, are not included in GNP. The sale and purchase of old goods, and of shares, bonds and assets of existing companies are not included in GNP, because these do not make any addition to the national product, and the goods are simply transferred.

Fifth the profits earned or losses incurred on account of changes in capital assets as a result of fluctuations in market prices, are not included in the GNP.

Lastly, the income earned through illegal activities is not included in the GNP.

2. Net National Product (NNP)

GNP includes the value of total output of consumption goods investment goods. But the process of production uses up a certain amount of fixed capital. Some fixed equipment wears out, its other components are damaged or destroyed, and still others are rendered obsolete through technological changes. All this process is termed depreciation or capital consumption allowance. In order to arrive at NNP, we deduct depreciation from GNP. The word 'net' refers to the exclusion So NNP = GNP – Depreciation.

NNP at Market Prices

Net National Product at market prices is the net value of final goods and services evaluated at market prices in the course of one year in a country. If we deduct depreciation from GNP at market prices, we get NNP at market prices. So NNP at market prices = GNP at Market Prices–Depreciation.

NNP at Factor Cost

Net National product at factor cost is the net output evaluated at factor prices. It includes income earned by factors of production through participation in the production process such as wages and salaries, rents, profits, etc. It is also called national Income. This measure differs from NNP at market prices in that, indirect taxes are deducted and subsidies are added to NNP at market prices in order to arrive at NNP at factor cost.

Thus NNP at Factor Cost = NNP at Market Prices – Indirect taxes + Subsidies

OR

National Income = GNP at Market prices – Depreciation – Indirect taxes + Subsidies

Normally, NNP at market prices is higher than NNP at factor cost because indirect taxes exceed government subsidies. However, NNP at market prices can be less than NNP at factor cost when government subsidies exceed indirect taxes.

3. Domestic Income or Product: (GDP – Gross Domestic Product)

Income generated (or earned) by the factors of production within the country from its own resources is called domestic income or domestic product. Domestic income includes:

(i) Wages and salaries

(ii) Rents, including inputted house rents

(iii) Interest

(iv) Dividends

(v) Undistributed corporate profits, including surpluses of public sector undertakings

(vi) Mixed incomes consisting of profit of unincorporated firms, self–employed persons, partnerships etc.

(vii) Direct taxes

Since domestic income does not include income earned from abroad, it can also be shown as: Domestic Income = National Income – Net Income earned from abroad. Thus the difference between domestic income and national income is the net income earned from abroad. If we add net income from abroad to domestic income, we get national income, i.e. National Income = Domestic Income + Net Income earned from abroad. But the net national income earned from abroad may be positive or negative if exports exceed imports, net income earned from abroad is positive, in this case national income is greater than domestic income. On the other hand, when imports exceed exports, net income earned from abroad is negative and domestic income is greater than national income.

4. Personal Income (PI)

Personal income is the total income received by the individuals of a country from all sources before direct taxes in one year. Personal income is never equal to the national income because the personal income includes the transfer payments whereas they are not included in national income. Personal income is derived from national income by deducting undistributed corporate profits, profit taxes, and employees contributions to social security schemes. These three components are excluded from national income because these do reach individuals. But business and government transfer payments, and transfer payments from abroad in the form of gifts and remittances, windfall gains and interest on public debt which are a source of income for individuals are added to national income. Thus Personal Income = National Income – Undistributed Corporate Profit – Profit Taxes – Social Security Contributions + Transfer Payments + Interest on Public Debt.

Personal income differs from private income in that it is less than the later because it excludes undistributed corporate profits.

Thus Personal Income = Private Income – Undistributed Corporate profits – Profit Taxes.

5. Disposable Income (DPI)

Disposable income or personal disposable income means the actual income which can be spent on consumption by individuals and families. The whole of the personal income cannot be spent on consumption, because it is the income that accrues before direct taxes have actually been paid. Therefore, in order to obtain the disposable income, direct taxes are deducted from personal income. Thus Disposable Income = Personal Income – Direct Taxes.

But the whole of the disposable income is not spent on consumption and a part of it is saved. Therefore, the disposable income in divided into consumption expenditure and savings. Thus Disposable Income = Consumption Expenditure + Savings.

6. Real Income

Real income is national income expressed in terns of a general level of prices of a particular year taken as base. National income is the value of goods and services produced as expressed in terms of money at current prices. But it does not indicate the

real state of the economy. It is possible that the net national product of goods and services this year might have been less than that of last year, but owing to an increase in prices, the NNP might be higher this year. On the, contrary, it is also possible that NNP might have increased but the price level might have fallen, as a result of which national income would appear to be less than that of the last year. In both the situations, the national income does not depict the real state of the country. To rectify such a mistake, the concept of real income has been propounded.

In order to find out the real income of a country, a particular year is taken as base year when the general price level is neither too high nor too low and the price level for that year is assumed to be 100. Now the general level of the prices for the given year for which the national income (real) is to be determined is assessed in accordance with the prices of the base year. For this purpose the following formula is employed:

$$\text{Real NNP} = \text{NNP for the current year} \times \frac{\text{Base year Index } (= 100)}{\text{Current year Index}}$$

7. Per Capita Income

The average income of the people of a country in a particular year is called Per Capita Income for that year. This concept also refers to the measurement of income at current prices and at constant prices. For instance, in order to find out the per capita income for 2008, at current price, the national income of a country is divided by the population of the country in that year.

$$\text{Per Capita Income for 2008} = \frac{\text{National Income for 2008}}{\text{Population in 2008}}$$

DIFFICULTIES IN THE MEASUREMENT OF NATIONAL INCOME

To calculate the national income of a country is a complicated problem because of following difficulties:

1. Measured in Money

National income is always measured in money, but there are number of goods and services which are difficult to "be assessed in terms of money", e.g., painting as a hobby by an individual, the bringing up of children by a mother.

2. Double Counting

The greatest difficulty in calculating the national income is double counting, which arises from the failure to distinguish properly between a final and an intermediate product. To solve this difficulty, only the final goods and services are taken into account, and that is not so easy task.

3. Illegal Activities

Income earned through illegal activities such as gambling, or sale of intoxicants etc., is not included in national income. Such goods and services do have value and meet the needs of the consumers. But by leaving them out, the national income works out to be less than the actual.

4. Transfer Payments

Then there arises the difficulty of including transfer payments in the national income. Individuals get pension, unemployment allowance and interest on public loans, but whether these should be included in national income is a difficult problem. On the one hand, these earnings are a part of individual income and on the other, they are government expenditure. To avoid this difficulty, these are deducted from national income.

5. Capital Gains or Losses

Capital gains or losses which occur to property owners by increase or decrease in the market value of their capital assets or changes in demand are excluded from the GNP because such changes do not result from current economic activities.

6. All Inventory Changes

All inventory changes whether negative or positive are included in the GNP.

7. Capital Depreciation or Capital Consumption

Capital depreciations are deducted from National Income. When we deduct capital depreciation from GNP, the resulting measure is NNP.

8. Price Changes

Another difficulty in calculating national income is that of price changes which fail to keep stable the measuring rod of money for national income. When the price level in the country rises, the national income also shows an increase even though the production might have fallen. On the contrary, with a fall in price level, the national income shows a decline though production might have gone up.

9. Under Estimation of Real National Income

Moreover the calculation of national income in terms of money is under estimation of real national income. It does not include the leisure foregone in the process of production of a commodity.

10. Public Services

In calculating national income, a good number of public services are also taken which cannot be estimated correctly. How should the police and military services be estimated? In the days of war, when the forces are active, but during peace they rest in cantonments.

PROBLEMS OF MEASUREMENT IN A DEVELOPING ECONOMY

In a developing economy, complete and reliable information relating to the various methods of estimating national income are not available due to the following problems:

1. Non-Monetised Sector

There is a large non-monetised sector in a developing economy. This is the subsistence sector in rural areas in which a large portion of production is partly exchange for the other goods and is partly kept for personal consumption. Such production and consumption cannot be calculated in national income.

2. Lack of Occupational Specialisation

There is the lack of occupational specialisation in such a country which makes the calculation for national income by product method difficult.

3. Non–Market Transaction

People living in rural areas in a developing country are able to avoid expenses by building their own huts, tools, implements, garments and other essential commodities. All such productive activities do not enter the market transactions and hence are not include in national income.

4. Illiteracy

The majority of people in such a country are illiterate and they do not keep any accounts about the production and sales of their products. Under the circumstances, the estimates of production and earned incomes are simply guessed.

5. Non-availability of Data

Adequate and correct production and cost data are not available in a developing country. Such data relate crops, forestry, fisheries, animal husbandry and the activities of petty shopkeepers, small enterprises, construction workers, etc.

METHODS OF MEASURING NATIONAL INCOME

There are four methods of measuring national income. Which method is to be employed depends on the availability of data in a country and the purpose in hand.

1. Product Method:

According to this method, the total value of final goods and services produced in a country during a year is calculated at market prices. To find out the GNP, the data of all productive activities, such as agricultural products, wood received from forests, mineral received from mines, commodities produced by industries, the contributions to production made by transport, communications, insurance companies/lawyers, doctors, teachers etc., are collected and assessed at market prices. Only the final goods and services are included and the intermediary goods and services are left out, e.g.

Sr. No.	Sectors of Economy	Percentage share
1	Agriculture	25
2	Forests	10
3	Minerals	13
4	Industry	18
5	Transport & Communication	14
6	Services	12
7	Others	08
	Total	**100**

PRECAUTIONS

1. In estimating National Income the market prices of only final products should be taken into account.
2. Goods and services rendered free of charge are not included.
3. The transactions which do not arise from the produce of the current year or which do not contribute in any way to production are not included.
4. The profits earned or losses incurred on account of changes in capital assets as a result of changes in market prices, are not included.
5. Income earned or goods produced through illegal activities are not included.

2. Income Method

According to this method, the net income payments reserved by all citizens of a country in a particular year are added up, i.e., net incomes that occured to all factors of production by way of net rents, net wages, net interest and net profits are all added together but incomes received in the form of transfer payments are not included in it. The data pertaining to income are obtained from different sources, for instance, from income tax department in respect of high income groups and in case of workers from their wages bills.

The income approach to GNP consists, of the remuneration paid in term of money to the factors of production annually in a country. Thus GNP is the sum of the following items:

(i) Wages and Salaries

Under this head fall all forms of wages and salaries earned through productive activities by workers and entrepreneurs. It includes all sums received or deposited during a year by way of all types of contributions like overtime, commission, provident fund, insurance etc.

(ii) Rent

Total rent includes the rents of land, shop, house, factory, etc., and the estimated rents of all such assets as are used by the owners themselves.

(iii) Interest

Under interest comes the income by way of interest received by the individual of a country from different sources. To this is added the estimated interest on that private capital which is invested and not borrowed by the businessman in his personal business. But the interest received on government loans has to be excluded, because it is a mere transfer of national income.

(iv) Dividends

Dividends earned by the shareholders from companies are included in the GNP.

(v) Undistributed Corporate Profits

Profits which are not distributed by companies and are retained by them are included in the GNP.

(vi) Mixed Incomes

These include profits of unincorporated businesses, self–employed persons and partnerships. They form part of GNP.

(vii) Direct Taxes

Taxes levied on individuals, corporations and other businesses are included in the GNP.

(viii) Indirect Taxes

The government levies a number of indirect taxes, like excise duties and sales tax. These taxes are included in the prices of commodities. But revenue from these goes to the government treasury and not to the factors of production. Therefore, the income due to such taxes is added to the national income.

(ix) Depreciation

Every corporation makes allowance for expenditure on wearing out and depreciation of machines, plants and other capital equipment. Since this sum also is not a part of the income received by the factors of production, it is, therefore, also included in GNP.

(x) Net Income Earned From Abroad

This is the difference between the value of exports of goods and services and the value of imports of goods and services. If this difference is positive, then it is added to GNP and if it is negative it is deducted from GNP.

Thus GNP according to Income Method = Wages and Salaries + Rents + Interest + Dividends + Undistributed Corporate Profits + Mixed Incomes + Direct Taxes + Indirect Taxes + Depreciation +-Net Income from abroad.

3. Expenditure Method

According to this method, the total expenditure incurred by the society in a particular year is added together and includes personal consumption expenditure, net domestic investment, government expenditure on goods and services and net foreign investment. This concept is based on the assumption that national income equals national expenditure.

From the expenditure view point, GNP is the sum total of expenditure incurred on goods and services during one year in a country. It includes the following items:–

(i) Private Consumption Expenditure

It includes all types of expenditures on personal consumption by the individual of a country. It comprises expenses on durable goods like building, Motor Car, Television etc., expenditure on single used consumers goods like milk, bread, ghee, clothes etc., and also the expenditure incurred on services of all kinds like fees for school, doctor, lawyer and transport. All these are taken as final goods.

(ii) Gross Domestic Private Investment

Under this comes the expenditure incurred by private enterprises on new investment and on replacement of old capital. It includes expenditures on house construction, factory buildings, all types of machinery, plants and capital equipment.

(iii) Net Foreign Investment

It means the difference between exports and imports or exports surplus. Every country exports to or imports from certain foreign countries. Every imported goods are not produced within the country and hence cannot be included in national income, but the exported goods are manufactured within the country. Therefore, the difference of value between exports (X) and import (M) whether positive or negative, is included in the GNP.

(iv) Government Expenditure on Goods and Services

The expenditure incurred by the government on goods and services is a part of GNP. Federal, Provinces or Local governments spend a lot on their employees, police and army.

Thus GNP according to expenditure Method = Private Consumption Expenditure (C) + Gross Domestic Private Investment (I) + Net Foreign Investment (X – M) + Government Expenditure on Goods and Services (G) or GNP = C + I + X – M) + G + N.F.E. (Net Foreign Earnings)

As already pointed out above, GNP estimated by either the income or the expenditure method would work out to be the same, if all the items are correctly calculated.

4. Value Added Method

Another method of measuring national income is the value added by industries. The difference between the value of material outputs and inputs at each stage of production is the value added. If all such differences are added up for all industries in the economy, we arrive at the gross domestic product. In calculating GNP the money value of final goods and services produced at current prices during a year is taken into account. This is one of the ways to avoid double counting.

ESTIMATION OF NATIONAL INCOME WITH THE HELP OF VALUE ADDED APPROACH

The increases in the value or worth of a commodity or a good at each stage of production process is called "value-added". To understand value-added approach consider the making of garments. Suppose a cotton producer produces and sells cotton for Rs.50,000. The value added by the grower is Rs.50,000. Now after ginning of cotton the value becomes Rs.70,000. The value added by the ginning factory is Rs.20,000 i.e., (Rs.70,000 – Rs.50,000). The value added by the spindle unit of a textile mill is Rs.30,000, the value added by a textile mill is Rs.50,000 by a garment factory Rs.70,000, and by the cloth merchants Rs.40,000. If we add all the values added at these stages we will get the market price of a garment.

If we add the 'net value added' by different sectors of the economy, we will get GNP at market price. The 'net value added' of every sector is equal to the market value of production by the sector minus purchases from other sectors.

TABLE

VALUE ADDED APPROACH

Stage of Production	Seller	Buyer	Sale Price	Value added
1	Cotton Producer	Ginning Factory	Rs.50,000	Rs.50,000
2	Ginning Factory	Spindle Factory	Rs.70,000	Rs.20,000
3	Spindle Factory	Textile Mill	Rs.100,000	Rs.30,000
4	Textile Mill	Garment Factory	Rs.150,000	Rs.50,000
5.	Garment Factory	Cloth Merchants	Rs.190,000	Rs.40,000
			Total	Rs.190,000

CIRCULAR FLOW OF NATIONAL INCOME

The circular flow of income and expenditure refers to the process, whereby the national income and expenditure of an economy flow in circular manner continuously through times. The various components of national income and expenditure such as saving investment, private consumption expenditure, etc., are shown in diagrams in the form of currents and cross currents in such a manner that national income equals national expenditure.

We begin with a simple hypothetical two sectoral economy where there are only two sectors, the household and business. The household/sector owns all the factors of production, that is, land, labour and capital. This sector receives income by selling the services of factors to the business sector. The business sector consists of producers who produce products and sell them to the household sector or consumers. Thus the household sector buys the output of products from the business sector. The circular flow of income and expenditure in such an economy is shown in figure, where the product market is shown in the upper portion and the factor market in the lower portion. In the product market, the household sector purchases goods and services from the business sector while in the factor market the household sector receives income from the former for providing services. Thus the household sector purchases all goods and services provided by the business sector and makes payments to the latter lieu of these.

The business sector, in turn, makes payments to the households for the services rendered by the latter to the business, wage payments for labour services, profits for organisation, rent to land owners and interest for capital supplied, etc. Thus payments go around in a circular manner from the business sector to the household sector, and from the household sector to the business sector, as shown by arrows in the outer portion of the figure. There are also flows of goods and services in the opposite direction to the money payments flows. Goods flow from the business sector to the household sector in the factor market, as shown in the inner portion of the figure. These two flows give GNP = GNI.

Fig. 1

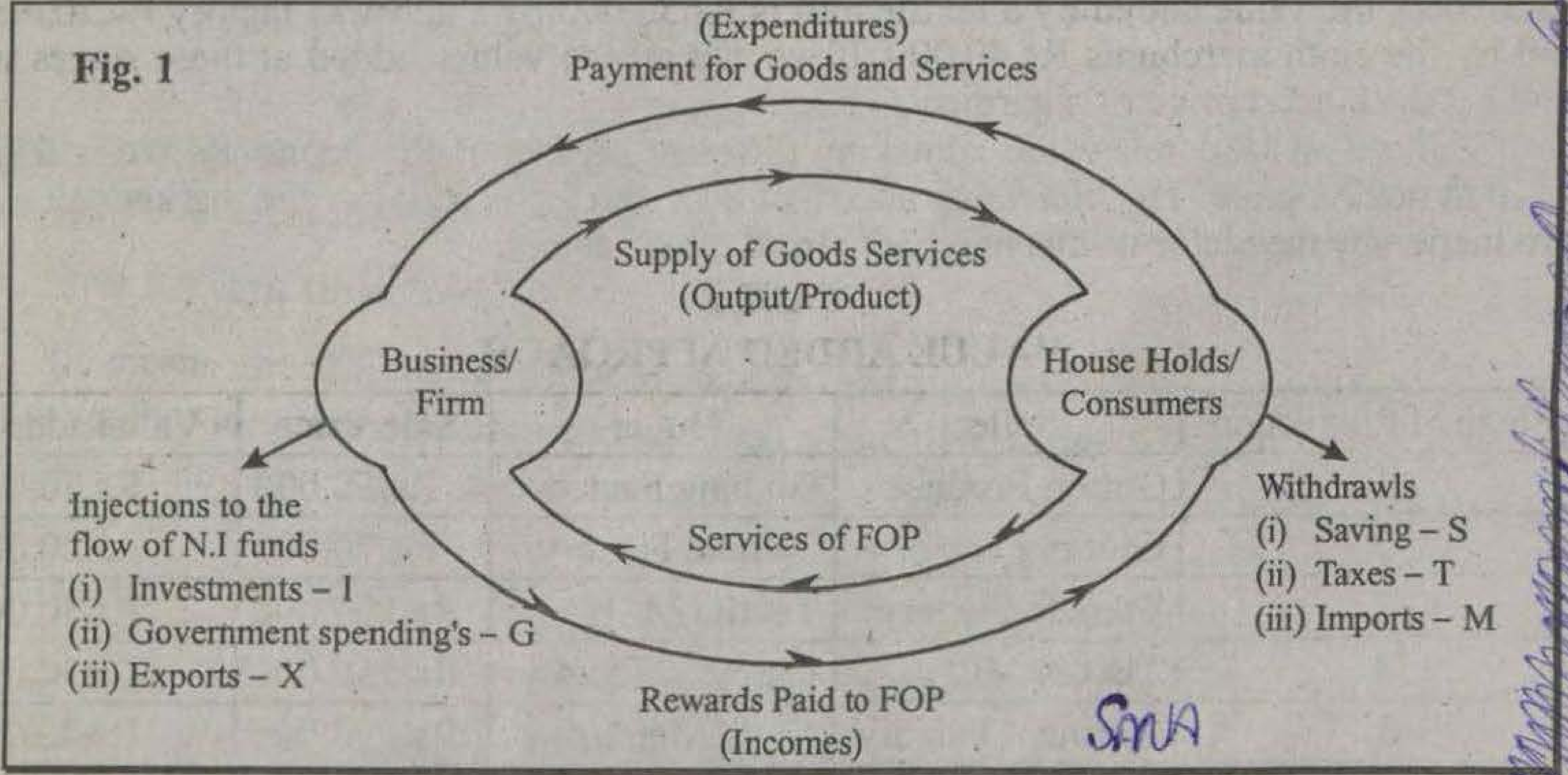
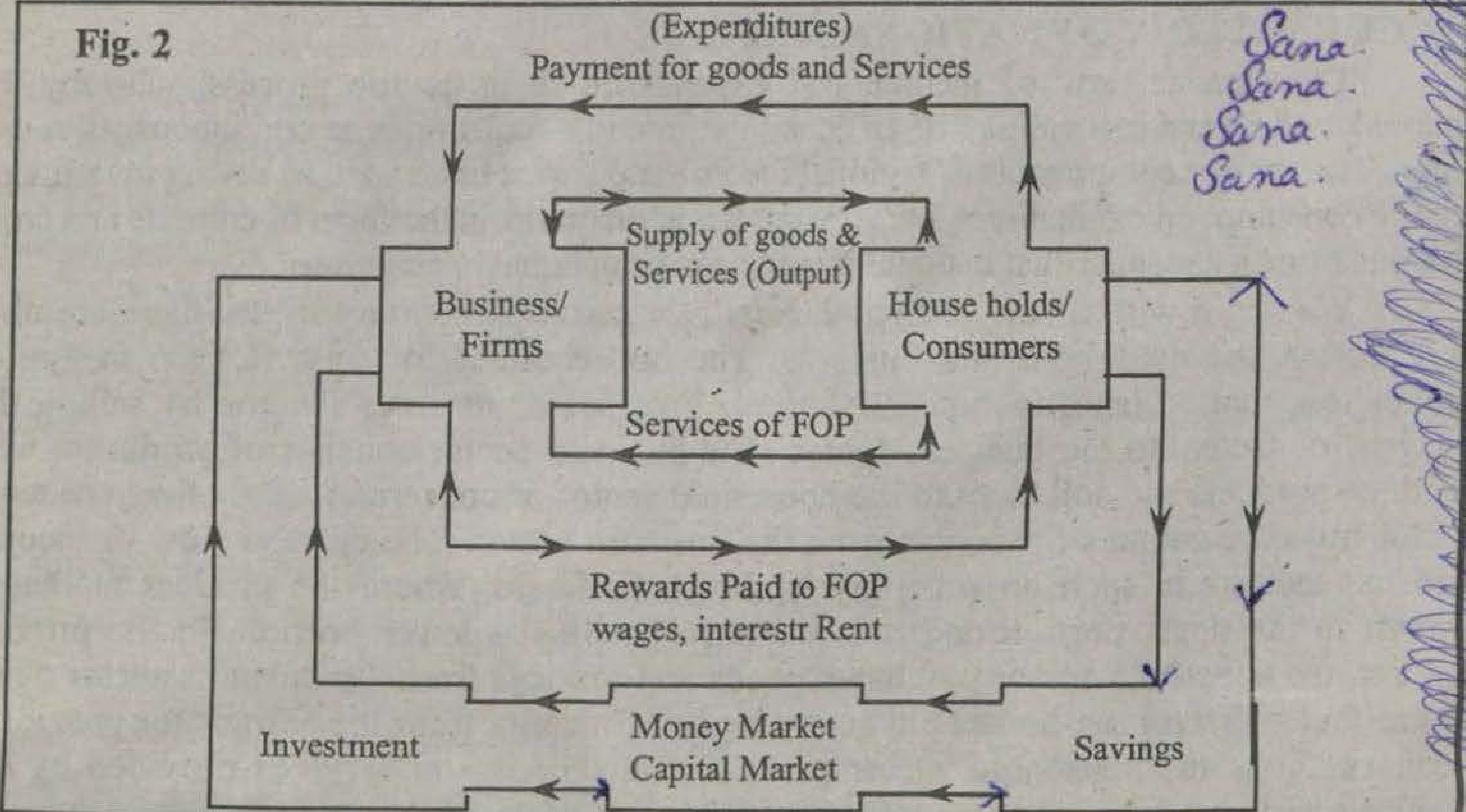


Fig. 2



The actual economy is not as explained above. In an economy, "inflows" and "leakages" occur in the expenditure and income flows.

Such leakages are saving and. inflows or injections are investment which equal each other.

Figure 1 shows how the circular flow of income and expenditure is altered by the inclusion of saving and investment. Expenditure has now two alternative paths from household and product markets:

(i) Directly via consumption expenditure, and

(ii) Indirectly via investment expenditure

In Figure 2 there is a capital or credit market in between saving and investment flows from household to business firm. The capital market refers to a number of financial institutions such as commercial banks, saving banks, finance institutions, the stock exchange market etc. The capital market coordinates the saving and investment activities of the households and the business firms. The households supply savings to the capital market and the firms, in turn, obtain investment funds from the capital market.

IMPORTANCE OF NATIONAL INCOME

The concept of the circular flow gives a clear-cut picture of the economy. We can know whether the economy is working efficiently or there is any disturbance in its smooth functioning.

It is with the help of circular flow that the problems of disequilibrium and the restoration of equilibrium can be studied.

The rule of leakages enable us to study their effects on the national economy. For example, imports are leaked out of the circular flow of income because they are payments made to a foreign country. To stop this leakage, government should adopt appropriate measures, so as to increase exports and decrease imports.

Similarly, savings are a leakage of the spending stream. This depresses the circular flow of income. On the other hand, consumption expenditures are inflows. If leakages exceed inflows, total spending is smaller than output. As a result, income and employment tend to decline over a period of time. On the other hand, if inflows exceed leakages, the spending stream is enlarged in the circular flow. This cause income and employment to rise in the next period.

The study of circular flow also highlights the importance of monetary policy to bring about the equality of saving and investment in the economy. Figure 2 shows that the equality between saving and investment comes about through the credit or capital market. The credit market itself is controlled by the government through monetary policy. When saving exceeds investment or investment exceeds savings, money and credit policies help to stimulate or retard investment spending. This is how a fall or rise in prices controlled.

IMPORTANCE OF NATIONAL INCOME

The study of National income is very much important as explained below:

1. Solution of Economic Problems

Study of National income is important to understand and analyse the economic problems and economic inequalities and to solve the economic problems.

2. Analysis of Economic Conditions

The economic status of country is analysed on the basic of national income, higher is the level of national income higher the living standard and vice versa.

3. Study of Rate of Economic Development

Persistent rise in national income of a country over a long period of time depicts the rate of economic development economic welfare and economic prosperity.

4. Study of Different Sectors of the Economy

Study of national income reveals the contribution made by different sectors of the economy e.g. agriculture, industry, minerals, bade, transportation etc.

5. Consumption, Saving and Investment

Study of national income provides information about the share of consumption expenditure, savings of the people and investment expenditures.

6. Economic Policies and Planning

Study of national income helps in formulation of economic policies because natural income figures depicts which sectors are developing and which sectors are backward therefore to make plans for industrial, agricultural, trade, transport, communication water power resources, forestry, minerals etc. study of national income provide the base.

All may conclude that the concept of national income is indispensable proportion for tackling the great issues of unemployment inflation inequatalole distribution of incomes, poverty and economic growth.

EXAMPLE: Given the following data of a firm in an economy during a certain period of time. Calculate GDP according to

(a) Income approach (b) Expenditure approach (c) Value added approach.

(i) Raw material imports Rs. 40,000

(ii) Wages and salaries paid Rs. 900,000

(iii) Output sold Rs. 2,000,000

(iv) Profits Rs. 700,000

(v) Pays its post tax profits to Share holders as divided to Rs. 400,000

(vi) Taxes on labour are Rs. 200,000 and the company Rs. 300,000

(vii) Domestic consumer's expenditure Rs. 1,100,000
(1,100,000 = 700,000 Profits + 400,000 dividends)

(viii) Govt. expenditures Rs. 500,000
(500,000 = 200,000 tax on labour + 300,000 tax on company)

(ix) Exports Rs.400,000.

SOLUTION:

(a) The expenditure approach.

(i)	Consumers expenditures	Rs. 1,100,000
(ii)	Govt: expenditures	Rs. 500,000
(iii)	Exports	Rs. 400,000
(iv)	Imports	(–) 400,000
	GDP Expenditure approach	1,600,000

(b) **Income Approach:**

Income received by the labour force	=	Rs. 900,000
Gross profits of the firms	=	Rs. 700,000
GDP Income approach		Rs. 1,600,000

(before deducting tax)

(c) Value added approach/output approach.

Total output produced & sold	=	Rs. 2,000,000
Imports	=	Rs. (–) 400,000
GDP Value added approach		Rs. 1,600,000

EXERCISE

The following data relates to the economy of a country over one year period.

	Rs. (in million)
Consumers expenditures	20,000
Federal government expenditures	4,500
Capital formation (savings)	5,100
Physical decrease in stocks	(100)
Exports receipts	7,000
Imports payments	6,500
Taxes on expenditures	6,000
Subsidies	500
Net property income from abroad	500
Depreciation (Capital consumption Expenditures)	2,000

Required:

(i) GDP at factor cost
(ii) GDP at market prices
(iii) GNP at factor cost
(iv) GNP at market prices
(v) National income at factor cost

SOLUTION:

	Rs. (million)
Consumption expenditure	20,000
Federal Govt. Consumption expenditures	4,500
Capital formation (Savings)	5,100
Value of physical decrease on stocks	(100)
Total domestic expenditures	29,500
Exports	7,000
Imports	(6,500)
GDP at market prices	30,000
Net property income from abroad	500
GNP at market prices	30,500
GDP at market prices	30,500
Taxes on expenditure	(6,000)
Subsidies	500
GDP at factor cost	24,500
Net property income from abroad	500
GNP at factor cost	25,000
Depreciation / Capital consumption	(2000)
National income at factor cost	23,000

NOTE NO. 1:

GDP at market prices = Consumption expenditures + Federal Govt. expenditures + Capital formation – physical decreas in stocks + Exports – Imports

NOTE NO. 2:

GNP at market prices = GDP at market prices (+) Net property income earned from abroad.

NOTE NO. 3:

GDP at factor cost = GDP at market prices – Taxes on expenditures + subsidies

NOTE NO. 4:

GNP at factor cost = GDP at factor cost + Net property income earned from abroad.

NOTE NO. 5:

National income at factor cost (NNP at factor Cost) = GNP at factor cost – Depreciation i.e., capital consumption.

Real and Money National Income:

(i) Money (or nominal) income (MNY) is the value of this year's output at current prices.

(ii) Real national income is the value of this year's output at constant prices and is calculated by using either of the following equations.

$$\text{Real Nation Income (RNY)} = \frac{\text{MNY}}{\text{GDP deflator}} \times 100$$

$$\text{Real National Income (RNY)} = \text{MNY} \times \frac{\text{Price index of base year}}{\text{Price index of current year}}$$

Measuring Country's Standard of Living: National Income measures the values of goods and services produced by a country in one year. An increase in the value of national, income implies an increase in economic welfare, unless:

(i) The increase has been brought about by inflation.

(ii) There is a corresponding increase in population.

(iii) Only a small fraction of population receive the benefits because of an unequal distribution of income.

(iv) Additional output results in negative externalities such as pollution.

(v) Additional output is on non-consumer items such as defence.

(vi) Increase in output is the result of harder conditions of work or reduced leisure time.

The standard of living refers to real national income per capita (person) and is calculated using the equation.

$$\text{Standard of Living} = \frac{\text{Real National Income}}{\text{Population}}$$

SHORT QUESTION ANSWER

Q.1 Define the concept of national income.

Ans. National Income: National Income is an uncertain term which is used interchangeably with national dividend, national output and national expenditure. On this basis national Income has been defined in a number of ways.

1. **The Marshallian Definition:** According to Marshall: the labour and capital of a country acting on its natural resources produce annually a certain net aggregate of commodities, material and non-material including services of all kinds. This is the true net annual income or revenue of the country or national dividend".

2. **Modern Definition:** From the modern point of view, Simon Kuznets has defined national income as "The net output of commodities and services following during the year from the country's productive system in the hands of ultimate consumers.

   OR

   Net national product, as addition to the shares of different factors, and as net national expenditure in a country in a year's time.

   OR

   NI = NNP – Indirect Taxes + Subsidies

Q.2 Define and differentiate between GNP and NNP.

Ans. Gross National Product (GNP): GNP is the total measure of the flow of goods and services at market value resulting from current production during a year in a country, including net income from abroad.

Net National Product (NNP): In order to arrive at NNP, we deduct depreciation from GNP. The word 'net' refers to the exclusion So NNP = GNP – Depreciation or capital consumption.

Q.3 Differentiate between NNP at market prices and NNP at factor cost.

Ans. NNP at Market Prices: Net national product at market prices is the net value of final goods and services evaluated at market prices in the course of one year in a country.

OR

NNP at market prices = GNP at Market Prices –Depreciation.

NNP at Factor Cost: Net National product at factor cost is the net output evaluated at factor prices. It includes income earned by factors of production through participation in the production process such as wages and salaries, rents, profits, etc. It is also called national income.

NNP at Factor Cost = NNP at Market Prices – Indirect taxes + Subsidies

Q.4 Define domestic income and give its components.

Ans. Domestic Income or Product: (GDP – Gross Domestic Product): Income generated (or earned) by the factors of production within the country from its own resources is called domestic income or domestic product. Domestic income includes:

(i) Wages and salaries

(ii) Rents, including inputted house rents

(iii) Interest

(iv) Dividends

(v) Undistributed corporate profits, including surpluses of public sector undertakings

(vi) Mixed incomes consisting of profit of unincorporated firms, self–employed persons, partnerships etc.

(vii) Direct taxes

Q.5 Define and different personal income and disposable personal income.

Ans. Personal Income (PI): Personal income is the total income received by the individuals of a country from all sources before direct taxes in one year.

Disposable Income (DPI): Disposable income or personal disposable income means the actual income which can be spent on consumption by individuals and families.

OR

Thus Disposable Income = Personal Income – Direct Taxes

Q.6 Define real national income.

Ans. Real Income: In order to find out the real income of a country, a particular year is taken as base year. Now the general level of the prices for the given year for which the national income (real) is to be determined is assessed in accordance with the prices of the base year. For this purpose the following formula is employed:

$$\text{Real NNP} = \text{NNP for the current year} \times \frac{\text{Base year Index } (= 100)}{\text{Current year Index}}$$

Q.7 Define per capita income.

Ans. Per Capita Income: The average income of the people of a country in a particular year is called Per Capita Income for that year.

OR

$$\text{Per capital income} = \frac{\text{National Income}}{\text{Population and income}}$$

Q.8 Define product method income method of measuring national income.

Ans. **Product Method:** According to this method, the total value of final goods and Services produced in a country during a year is calculated at market prices.

Income Method: According to this method, the net income payments received by all citizens of a country in a particular year are added up, i.e., net incomes that occurred to all factors of production by way of net rents, net wages, net interest and net profits are all added together but incomes received in the from of transfer payments are not included in it.

Q.9 Define expenditure method and value added method of measuring national income.

Ans. **Expenditure Method:** According to this method, the total expenditure incurred by the society in a particular year is added together and includes personal consumption expenditure, net domestic investment, government expenditure on goods and services and net foreign investment.

Q.10 Define value added method.

Ans. **Value Added Method:** Another method of measuring national income is the value added by industries. The difference between the value of material outputs and inputs at each stage of production is the value added.

Q.11 Define circular flow of national income.

Ans. **Circular Flow of National Income:** The circular flow of income and expenditure refers to the process, whereby the national income and expenditure of an economy flow in circular manner continuously through times.

Q.12 How can we calculate GDP at market prices and GNP at market prices?

Ans. **GDP at Market Prices:**

= Consumption expenditures + Federal Govt. expenditures + Capital formation – physical decrees in stocks + Exports – Imports

GNP at Market Prices:

= GDP at market prices (+) Net property income earned from abroad.

Q.13 How can we calculate GDP at factor cost GNP at factor cost and NNP at factor cost?

Ans. **GDP at Factor Cost:**

= GDP at market prices – Taxes on expenditures + subsidies

GNP at Factor Cost:

= GDP at factor cost + Net property income earned from abroad.

National income at factor cost (NNP at factor Cost)

= GNP at factor cost – Depreciation i.e., capital consumption.

Q.14 What do you understand by stock appreciation and residual error?

Ans. **Stock Appreciation:** Stock appreciation is the increase in the value of inventories brought about by inflation.

Residual Error: Occurs because income and expenditure data are collected from different sources. An amount is included to balance the difference between these estimates.

Q.15 Define net property income earned from abroad.

Ans. **Net property Income from Abroad:** Net property income from abroad is the difference between income received from a country, ownership of overseas asset and income paid out to overseas owners of a country asset.

Q.16 Give a formula to calculate NNP at factor cost from total domestic income.

Ans. **NNP at Factor Costs:**

Total domestic Income − Stock appreciation residual error = GDP at factor Cost + Net property Income from abrood = GNP at factor Cost

− Capital Consumption = NNP at factor Cost

Q.17 Calculate GDP at factor cost from total domestic expenditures.

Ans. **GDP at Factor Cost:**

Total domestic expenditure + Exports − Imports = GDP at market Prices − Taxes on expenditure + Subsidies = GDP at factor Cost

Q.18 Give national income accounting equations.

Ans. **National Income Accounting Equations:**

(i) GNP = GDP + Net property income from abroad

(ii) NNP = GNP − Capital consumption

(iii) Gross investment = Net investment + Capital Consumption

(iv) Factor cost = Market prices − Expenditure taxes + Subsidies

EXERCISE

Q.1 Define National Income. Discuss the various concepts of National Income.

OR

Define National Income & differentiate between:

(a) Gross National Product (GNP), Net National product and Gross Domestic Product (GDP).

(b) Personal Income (P.I.) and Disposable Personal Income (DPI).

Q.2 Discuss the difficulties in measuring National Income.

OR

Discuss the main problems in measuring National Income, in developing Economies?

Q.3 Discuss the different methods of measuring National Income?

Q.4 Define Circular Flow of Income. Why it is called circular? Explain with the help of diagrams or Discuss and explain circular flow of income and expenditure in two sectors economy.

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CHAPTER

14

PUBLIC FINANCE

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PUBLIC FINANCE

In public finance we study the collection of revenue and expenditure by the state. Public finance can be divided into four branches:

(a) **Public Expenditure** i.e., allocation of public funds to different uses and their effects on the economy.

(b) **Public Revenue:** In public revenue we study the nature, classification and burden of taxes.

(c) **Public Debit:** We study public borrowings and landings.

(d) The study of Budget as a whole.

OBJETIVES OF PUBLIC FINANCE

1. Control the important sectors.
2. Provision of basic services to citizens e.g., defence, law & order.
3. To arrange for maximum social services to people.
4. To bring economic and price stability in the country to attain accelerated rate of growth and development.
5. To set priorities of private and public investment in different sectors of the economy.
6. To provide full employment, correction of balance of payments, to control inflation and deflation, economic planning breaking up monopolies and inequalities of income.

Private & Public Finance

The management of personal and private income to make certain and specified expenditures is known as private finance while state management of its revenue and expenditure is public finance.

There are some similarities and dissimilarities in private and public finance.

Similarities

1. Both private and public finance have utmost try to balance their income and expenditures.
2. Private finance and public finance both work for maximum benefits of the scarce resources at their disposal. Individuals try to maximise satisfaction and state has the objective of maximum welfare of the society.
3. In both the cases the gap between current income and expenditure is filled through borrowings.
4. Both can increase their incomes by making more investment.

Dissimilarities

1. Individuals adjust their expenditure to their income while government adjusts their incomes according to the expenditures.
2. Individuals do not have specific budget period. This period may be a week, a month may be 3 months, 6 months or an year while government prepares its budget for one year.
3. Private sector may or may not keeps the record of its income and expenditures while government keeps permanent record of its income and expenditure.
4. Individuals borrow from other persons, e.g., friends, relatives, shopkeepers, traders or from financial institutions. While government arrange for loan not only from domestic financial institution but also from international financial institutions and other countries.
5. Government can increase the supply of money through the process of deficit financing while it is not possible for individuals.
6. Individuals have the objective of maximum personal satisfaction while government has the objective of social welfare of the people.
7. Individuals during the times of difficulty and adversity cannot bring about big and deliberate changes in income and expenditure while it is fairly easy for the government to bring big and deliberate changes in income and expenditure.
8. A surplus budget for the individuals is a dream and they are known as prudent consumers while the budget surplus for the government is treated as inefficiency of the government.
9. Individuals keep secrecy of their income and expenditures while government gives publicity to its fiscal policy i.e., revenue and expenditures.

CHARACTERISTICS OR QUALITIES OF GOOD TAX SYSTEM

1. **Principle of Equity**

The tax system should meet the cannon of equity. Every person should be taxed according to his ability. That is, the rich should pay more and the poor less so that taxes should be progressive in nature.

2. **Principle of Certainty**

A good tax system should be based on the cannon of certainty. "The time of payment, the mode of payment, the quantity to be paid, ought all the contributor and to every other person". The tax which every individual is required to pay should be certain and not arbitrary so that he is left to the whims of the tax officials.

3. **Principle of Convenience**

The tax system should satisfy the cannon of convenience, i.e., the time and mode of payment of the tax should be so fixed that it is convenient for the tax payer.

4. **Economical**

A good tax system should be economical to the government in the sense that the cost of collection of the tax should be small in proportion to the revenue from them.

5. **To Bring in Sufficient Revenue**

The tax system should be such as to bring in sufficient revenue in the exchequer. In other words, it should be productive.

6. **Elastic**

A good tax system should be sufficiently elastic so that the tax revenue may be increased or decreased according to the requirements of the state.

7. **Simple**

The tax system should be simple to understand and administer.

8. **Multiple Taxes**

A good tax system should have multiple taxes rather than a single, tax. "It is best to rely on a few substantial taxes for the bulk of the tax revenue. In so far as it is desired to tax the rich, income and inheritance taxes are the best means, in so far as it is desired to tax the poor, taxes on a few commodities of wide consumption, preferably commodities not necessary to health and efficiency. Other taxes on luxuries have their legitimate place and some taxes with special objects may be added, but it is desirable to keep their number within bounds".

9. **Income Elastic**

A tax system should be income elastic. As national income increases, the share of taxation in national income should rise more than proportionately.

10. **The Least Bad Economic Effect**

According to Dalton, "The best system of Economic effects taxation from the economic point of view is that which has the best, or the least bad, economic effects". It should not adversely affect production through effects on ability and desire to work, save and invest.

11. Reduce the Inequality of Incomes

According to Wagner, the German, economist a good tax system should reduce the inequality of incomes i.e., it administers the gap between the rich and the poor.

12. Balanced

Last but not the least, the tax system should be a balanced one in which progressive, proportional, direct and indirect taxes should be properly distributed.

The major problem is to find a sufficient number of taxes that may satisfy these criteria. But treasury officials can no more find one tax that pre-eminently meets all requirements than an automobile engineer can design a car that is simultaneously fastest, safest and cheapest.

DIRECT AND INDIRECT TAXES

A direct tax is really paid by the person on whom it is legally imposed, while an indirect tax is imposed on one person, but paid partly or wholly by another, owing to a consequential change in the terms of some contract or bargain between them. Thus an indirect tax is conceived as one which can be shifted or passed on, a direct tax as one which cannot be transferred. An indirect tax is that levied on the sale or purchase of any goods or services other than personal services and that can be transferred.

PROPORTIONAL VERSUS PROGRESSIVE TAXATION

The proportional system of taxation was advocated by Classical Economists. Under this system the individuals are required to pay tax in proportion to their income, i.e., rate of tax remains same as the base is changed.

Taxation is said to be progressive when the rate of tax increases as the tax base increases and tax rate decreases with the decrease in income.

MERITS AND DEMERITS OF DIRECT TAXES

MERITS

Direct taxes possess the following merits:

1. Equitable

Direct taxes are based on the cannon of equity. Their burden is equally distributed as they are progressive in nature.

2. Certain

Direct taxes satisfy the cannon of certainty. The tax payer is certain as to the time and mode of payment, and the amount is also certain as the amount of money it shall receive from these taxes.

3. Economical

These taxes also satisfy the cannon of economy. The cost of collection of direct taxes is low. In the case of income tax it is deducted at source from the salaried persons.

4. Elastic

Direct taxes are flexible and thus satisfy the cannon of elasticity. The government can increase or decrease the rates of direct taxes according to the requirements of the economy.

5. **Simple**

Direct taxes are simple and easy to understand.

6. **Desirable**

These taxes do not involve general opposition from the public because they are paid by those persons or firms who come under the juristiction of income tax.

7. **Reduce Inequalities**

These taxes help to reduce income and wealth inequalities because of their progressive nature. The rich are taxed heavily while poor are exempted.

8. **Civic Consciousness**

Direct taxes inculcate civic consciousness among the taxpayers. They are conscious that they are paying taxes to the government and take interest in the activities of the state.

DEMERITS

Direct taxes have the following demerits:

1. **Pinch**

Direct taxes pinch the taxpayers because they have to pay them directly out of their income or salaries.

2. **Inconvenient**

These taxes are inconvenient in nature because traders, businessmen, producers, etc., have to comply with a number of formalities relating to their sources of income and expenditure incurred in earning that income.

3. **Arbitrary**

Direct taxes possess an element of arbitrariness in them. They leave much to the discretion of the taxation authorities.

4. **Evasion**

Since direct taxes pinch every taxpayer, he tries to evade them by filing wrong returns and even takes the help of income tax experts.

5. **Discourage Saving and Investment**

Direct taxes adversely affect saving and investment.

6. **Discourage Production**

Direct taxes discourage those industries and firms which produce essential goods.

MERITS AND DEMERITS OF INDIRECT TAXES

Indirect taxes have also their merits and demerits.

MERITS

Indirect taxes possess the following merits:

1. **Convenient**

Indirect taxes are less inconvenient and less burdensome. They are paid only when a commodity or a service is bought.

2. **Wide Coverage**

These taxes reach the pockets of all income groups low, middle and high. They are levied on necessities, comforts and luxuries. Thus they have a wide coverage.

3. Elastic

Indirect taxes are elastic in the sense that the government can increase or decrease the rate of taxes.

4. Diversity

Indirect taxes satisfy the cannon of diversity. They can be levied on a variety of commodities and services.

5. Less Evaluation

There is less possibility of evasion in the case of indirect taxes because they are included in the prices of commodities.

6. Check the Consumption of Harmful Goods

Indirect taxes have the great merit of checking the consumption of harmful goods like, cigarettes and other intoxicants. The state levies heavy duties on such articles or consumption which are injurious to health.

7. Powerful Tool of Economic Policies

Indirect taxes can be used as a powerful tool for implementing economic policies by the government. If the government wants to protect domestic industries from foreign competition, it can levy heavy import duties. This will help to develop domestic industries.

DEMERITS

The following are the demerits of indirect taxes:

1. Uncertain Revenue

The revenue from indirect taxes is uncertain because it is not possible to accurately estimate the effect of such taxes on the demand for products. If a heavy excise duty is levied on some luxury articles, its price will rise. Since the demand for luxury goods is elastic, its sales may be adversely affected fall in demand and the state revenue may actually decline.

2. Uneconomical

These taxes are uneconomical in that the cost of collection to the state is heavy. The state has to appoint inspectors to check the accounts and stocks of producers, wholesalers, and retailers.

3. Bad Effect on Production and Employment

Sometimes, these taxes adversely affect production of commodities and even employment. When the price of a commodity increases due to a tax, its demand falls.

4. Feed Inflation

Another demerit of indirect taxes is that they feed inflation. Imposition of these taxes tends to raise the prices of commodities.

5. Lack of Civic Consciousness

A person who buys a commodity does not know that he is paying tax to the government in the price of the commodity. Therefore, such taxes do not inculcate civic consciousness.

MERITS OF PROGRESSIVE TAXATION

1. Equality of Sacrifice

The most powerful argument advanced for progressive taxation is that it leads to equality state.

2. Yields more Revenue

Progressive taxation is also justified on the grounds that it yields more revenue to the state.

3. Reducing the Inequality in Income

The merit of progressive taxation lies in the fact that it greatly helps in reducing the inequality in income.

4. Entails Less Expenses on Collection

Progressive taxation is advocated on the ground that it entails less expenses on collection. The tax is economical because when the rate of tax increases with the increase in income, the money spent on administration and collection does not increase.

5. Cannon of Elasticity

Another merit for the system of progressive taxation is that it conforms to the cannon of elasticity, a state can easily increase its revenue by raising the rate of tax a little.

6. To achieve full Employment

If we want to achieve full employment in the country, then progressive taxation is an imperative necessity.

DEMERITS OF PROGRESSIVE SYSTEM OF TAXATION

1. Gradual Robbery

As the rates of taxes are fixed on purely personal valuation, therefore, they may not lead to equal sacrifice.

2. Discourage Savings

Another objection levied against this theory is that if the rate of progression is very high, it will discourage savings, impede the accumulation of capital and thus hamper the economic development of the country.

3. Tax Evasion

It is also pointed out that a very steep progression encourage evasion of taxes. People may try to conceal their incomes by showing false statements.

MERITS OF PROPORTIONATE TAXATION SYSTEM

The main advantages claimed for proportional system of taxation are that it is the most equitable method of raising revenue open to the state.

DEMERIT OF PROPORTIONATE TAXATION SYSTEM

The greatest drawback of the proportional system is that it does not entail equal sacrifice.

Regressive Tax

If the tax rate decreases with the increase in income and increases with the decrease in income. A tax is called regressive tax.

CANNONS OF TAXATION/PRINCIPLES OF TAXATION

Adam Smith was the first leading economist who stated four cannons of taxation. These are the basis of tax system. Afterwards, economists of the modem time have evolved some other principles that are too important for description. A brief statement of all the cannons is given here.

Cannons of taxation refer to the administrative aspects of a tax. They relate to the **rate, amount** and **method to** levy and collection of a tax. In other words, the characteristics or qualities that a good tax should possess are described as cannons of taxation. It must be noted that cannons refer to qualities of an isolated tax and not to the tax system as a-whole.

Adam Smith has stated four cannons or maxims of taxation on the administrative side of public finance which are still recognized as classic. To him, a good tax is one, which contains:

1. The cannon of equality
2. The cannon of certainty
3. The cannon of convenience, and
4. The cannon of economy.

1. The Cannon of Equality

A good tax should embody the rationale of equity or justice. The term equality thus signifies equality of sacrifice involved and not the amount of tax paid. Thus, a good tax must ensures equity of relative sacrifice. The tax has to be such that it is paid in accordance with one's ability to pay.

This cannon is however, difficult to supply in practice, as the measurement of ability to pay is not an easy matter.

2. The Cannon of Certainty

This cannon implies that the tax which each individual is bound to pay ought to be certain and not arbitrary. The time of payment, the mode of payment, the amount to be paid etc., should be clear and certain to the taxpayer in advance so that he may adjust his expenditures accordingly.

3. The Cannon of Convenience

According to this cannon, there should be an appropriate timing of tax collection and its mode receiving payments should be such which is easy and convenient to the taxpayers.

4. The Cannon of Economy

It implies that there should not be any extravagance of unnecessary expenditure in the collection and administration of taxes. The cost of tax collection should be the minimum. A tax should be such which does not involve large machinery for its collection.

5. Cannon of Productivity

The cannon of productivity indicates that a tax when levied would produce sufficient revenue to the government. If a few taxes imposed yield a sufficient fund for the state, then they should be.

6. Cannon of Elasticity

Cannon of elasticity states that the tax system should be fairly elastic so that if at any time the government is in need of more funds it should augment its financial resources without incurring any additional cost of collection and reduction in the incentive to production.

7. The Cannon of Simplicity

It signifies that the levy and structure of a tax should be simple and intelligible to the common man. A tax should be simple in nature so that the tax payer is able to calculate it and pay it conveniently.

8. Cannon of Diversity

Variety in taxation is desirable, feasible from the equity, stability and yield point of view. So there should be different kinds of taxes which will facilitate for paying thorn.

9. Social and Economic Aims

The other important kind is that it should be compatible with economic and social objectives.

FISCAL POLICY

Fiscal policy means the process of shaping government taxation and government spending so as to achieve certain objectives. In the words of Prof. Lindholn Fiscal Policy means the development of the type, the time and the procedure to be followed in making government expenditures and in obtaining government revenue. According to Paul A. Samuelson "By a positive fiscal policy we mean the proceeds of shaping public taxation and public expenditure".

Professor Lipsey defines thus, "Government's revenue raising and its spending activities are called Fiscal Policy".

In short fiscal policy refers to the taxing, spending and borrowing policy of the government. It is mainly concerned with the process of shaping, government revenue and government expenditure so as to achieve certain important, specific and main objectives.

OBJECTIVES OF FISCAL POLICY/PUBLIC FINANCE

1. Economic Growth

The basic objective of a fiscal policy is to promote economic growth in the economy. In all countries, whether developed or under developed, the state gives top priority to economic development i.e., raising if national income, per capita income and standard of living.

Govt. adopts certain measures to stimulate the rate of growth in the economy. The fiscal measures like deficit financing, deficit budget and borrowings are very helpful in promoting economic growth.

2. Fair Distribution of Income

In a free enterprise economy, economic development is always accompanied by inequalities in the distribution of wealth. A small group of population becomes richer and richer and majority of the population becomes poorer and poorer.

A prominent objective of fiscal policy is to minimize the disparity in the distribution of wealth. Disparities of income can be minimized by taxing high income groups at a progressive rate and by subsidizing the cost of living of the poor people.

3. Full Employment

The achievement of full employment is another objective of fiscal policy. Employment level can be increased by giving incentives to investors and govt., though fiscal policy can induce by lowering down the tax rate or by increasing slabs. Income tax holiday and reduction in other taxes may bring larger investment.

4. Economic Stability

Economic fluctuations are very frequent in a free enterprise economy. This inject the element of instability in the economy. Sometimes the economy has to suffer from the undesirable situation of depression and sometimes there is a problem of inflation.

In order to obtain stability, the govt. adopts the policy of deficit budget in depression and surplus budget in inflation.

5. To Discourage the Production of Unnecessary Goods

Production of intoxicant and other injurious to health goods can be stopped through heavy taxation. Production of Cigarettes may be in the individual interest but not in the interest of the nation. The govt. imposes heavy taxes on such commodities so as to discourage their production.

6. To Correct the Disequilibrium in the Balance of Payments

Disequilibrium in the balance of payments arises when the import payments of a country exceeds its exports. To correct this disequilibrium the govt. may adopt certain fiscal measures.

On the one hand a heavy custom duty and tariffs are imposed in order to discourage the volume of imports and on the other hand, the govt. may provide subsidies to those industries which are producing exportable goods. When imports are discouraged and payments are stimulated, the disequilibrium in the balance of payments is corrected.

7. Value of Money

Changes in the value of money cause instability in the economy. Therefore, govt. action is necessary to stabilize the value of money. During inflation govt. reduces private expenditure. In case of deflation government increases its own expenditure and encourages private expenditures by a cut in taxes. That is, Govt. gives relief to taxpayers and they are induced for investment.

8. Suitable Consumption Level

It is also necessary that through fiscal policy a suitable and desirable level of consumption should prevail in the country.

The long run objectives of Fiscal Policy are as follows:

(i) High Level of Employment

The economic system may operate below or above the high level of employment. Modern economists, therefore, advocate that long-run basic aim of the fiscal policy should maintain growing high level of employment without inflation in the country.

(ii) Stabilization of Price Level

Stabilization of price level is another long run objective of the fiscal policy. When prices begin to rise the government should adopt contracting fiscal policy and when they begin to fall, the expansionary fiscal policy should be adopted.

(iii) Reduction in Inequality of Income

The modern economists are of the view that reduction in the inequality of income should be one of the aim of fiscal policy. The government should tax the rich people at a progressive rate and spend the income for the benefits of the poor.

ELEMENTS / PRINCIPLE WEAPONS / TOOLS / INSTRUMENTS OF FISCAL POLICY

The government uses various fiscal weapons to achieve full employment in an economy without inflation or deflation. They are as follows:

THE BUILT-IN-STABILIZERS

The automatic or built-in-stabilizers are as follows:

1. Taxes

Our present taxation system automatically operates to eliminate the cyclical fluctuations in the economy. When there is a rise in prices, rise in profits and the need is to contract the inflationary pressure, the progressive tax system comes to rescue and contracts the surplus purchasing power from the economy and vice versa.

2. Unemployment Allowance

In advanced countries of the world, people receive unemployment allowance and other welfare payments when they are out of job. As soon as they get employment, these payments are stopped. When national income is increasing, the unemployment fund grows due to two main reasons:

(i) The government receives greater amount of payroll taxes from the employees, and

(ii) The unemployment allowance decreases. During depression unemployment allowance and other welfare payments augment the income stream and they prove a powerful factor increasing income, output and employment in the country.

3. Farm Aid Programs

Farm aid programs also stabilize against cyclical fluctuation. When the prices of the agricultural products are falling and the economy is faced with depression, government purchases the surplus products of the farmers. The income and total spending of the agriculturists thus remains stabilized.

When the economy is expanding, the government sells these stocks and absorbs the surplus purchasing power. It thus reduces inflationary potential by increasing the supply of goods and contracting the pressure.

4. Corporate Savings and Family Savings

The corporations and companies and wise family members too play an important part to contract cyclical fluctuations. For instance, the corporations withhold part of the dividends of the boom years to pay in the depression years. Similarly, wise persons also try to save during the prosperous days in order to spend the savings in the difficult time.

5. Public Expenditure

An increase in public expenditure during depression adds to the aggregate demand for goods or services and leads to a increase in income and during inflation reduction in public expenditure reduces aggregate demand, national income, employment and prices. Thus inflationary and deflationary pressures can be controlled in this way.

6. Public Revenue

A reduction in taxes affects in raising the disposable income of the people which in turn increases consumption and investment expenditures of the people, on the other hand an increase in taxes tends to reduce disposable income and as a result there is reduction in consumption and investment expenditure.

7. Public Debit

To control inflationary and deflationary pressures government changes its fiscal policy. During depression government by public lending increases the income, consumption and investment while during inflationary pressures government borrows from the financial institutes to decrease the disposable income, consumption and investment expenditures.

ZAKAT

The word Zakat means to purify, to grow and to improve. It refers to the purification of soul, character, life and wealth, which is acquired after the payment of Zakat. Wealth is dear to everyone, but who spends wealth on others attains goodness and purity. This aspect of purification has been stated in Sura Al-Taubah in these words: "Take alms (Zakat) out of their property, thou wouldst cleans them and purify them thereby".

The wealth, which is accumulated in few hands and not spent for other, creates certain evils in the society. It leads towards class conflict in the society. The payment of Zakat removes all such types of evils from the society.

Zakat is levied to attain the following objectives:

1. Purification of Soul

Zakat purifies the soul of contributor from the evils of miserness. It makes them humble and God fearing. This also cleans wealth creates love among people.

2. Healthy Growth of the Community

The payment of Zakat leads to the healthy growth of the community. The amount collected through Zakat it spent for the uplift of the poor and welfare of the masses.

3. Narrow Down the Economic Inequalities

One of the most important objective of Zakat is to narrow down the economic inequalities in the community to the minimum possible limit. Its aim is to keep the economic differences among the people within safe and justified limits so that the rich may not grow richer and the poor, poorer. Zakat is a religious duty of the rich people to pay in order to help the poor members of the community. In this way Islam keeps the wealth in circulation and does not let it concentrate in few hands.

4. Wider Circulation of Wealth

Islam being a natural Din and does not let the income to be concentrated in few families. Zakat institution is strong weapon for fulfilling this major aim. The mechanism of Zakat will be helpful, as the money would go to poor class from rich group. It increases the speedy circulation which is necessary for running smoothly the economic system.

5. Main Source of Income

Zakat occupies central position in the financial structure of Muslim state, because it contributes too much towards national treasury or Baitul-Mal, whose doors are always open for help to needy and deserving persons.

6. Fair Distribution of Wealth

As Islam is against accumulation of wealth in few hands, therefore, Zakat meets an important purpose for spreading and distributing of wealth that becomes just and equitable. It guarantees that income is not centralized rather moves very rapidly among different groups of society and which turn leads to growth.

7. Minimizes Unemployment

Zakat is very vital instrument for removing unemployment. The money received by the poor can be used and he can start a business for supporting his family. Moreover benefit from it.

8. Removal of Crisis

If people hold money in gold or cash, they will have to pay Zakat on it, hence they prefer to do business instead of hoarding or keeping it idle. It pushes the level of investment, output and employment that do away with depression.

9. Up-Rooting Poverty

Zakat is significant tool of eliminating poverty and diversity from the society. It brings about prosperity. The people become well off and their all needs and wants are fulfilled easily.

10. Mobilization of Resources

Another point throws light on its importance that such individuals who get income in the shape of Zakat are in a position to utilize the available resources with it. In this way maximum use of resources becomes possible and the nation feels its advantages to great extent.

11. Economic Security

The Zakat is a shining and simple principle that is very helpful to the persons who sometimes are caught in adversity and misfortune. The well off individuals can give them financial aid, hence they would be in a position to get rid of the problem. So it provides social security.

12. Controlling Crimes

We know that several people indulge themselves into evil of theft, corruption, adulteration, fraud and dodge because of having small income. They cannot meet their genuine needs sometimes and become criminals. Zakat is a strong safe guard against these doings. It can be used for over coming them. It washes away greediness and selfishness and creates moral courage.

13. Other Merits

Zakat is main source for spreading Islam, because new believers are helped by it. The payment of Zakat is a way of thanking to God, it is an inner feeling that if the institution of Zakat is properly maintained, it is useful for establishing ideal state which is cry of modern time.

DIFFERENCE BETWEEN ZAKAT AND TAX

1. Rate

The rate of Zakat has been (2.5%) fixed for all times, it cannot be changed. The saving of a person up to Rs. 4,000 is Zakatable. But tax is levied on income and its rate is easily changeable by the government.

2. **Payment**

It is a religious duty to pay Zakat and believers feel pleasure, while paying of tax is not a sacred duty, it is also paid by Non-Muslims even.

3. **Kinds**

Tax is of several forms, but imposed only on money, whereas Zakat is levied on cash, gold and animals as well but has no kinds.

4. **Period**

Zakat is payable after full year has passed, but it is not necessary for tax, because it can be imposed less than his period.

5. **Exemption**

Tax can be exempted, but Zakat is to be paid at any cost, the state can't do so.

6. **Collection**

Zakat can be paid individually, while the government collects tax. Although government is authorized to collect Zakat, but not always is so.

7. **Utilization**

The items of expenditure regarding Zakat have been clearly determined in Quran and it cannot be spent elsewhere, but it is not the case for tax. The amount of tax can be spended by government in any way it likes.

8. **Purification**

The paying of Zakat is very important and it purifies the wealth, but tax does not serve this purpose.

9. **Nisab (Ceiling)**

Nisab for Zakat is on gold amounting to weight of $7\frac{1}{2}$ Tolas, silver $52\frac{1}{2}$ Tolas at their market values. But taxable income varies from time to time.

ROLE OF ISLAMIC STATE

The concept of sovereignty occupies central position in modern state. It is defined as a theory of politics that leads to an ultimate overseer in decision-making process of state and which explain rules and regulations. Government exercises most powers.

But Islamic view point is very different. Allah is Supreme authority, all powers rest with him solely. However, he has delegated powers for conducting worldly affairs. It has been mentioned in the Holy Quran, "Say: O, Allah! Owner of power! Thou giveth sovereignty unto whom Thou pleaseth and withdrawest of power from wh
(3:26, 129, 154, 189). "And who has no partner in the sovereignty" (17:111

FUNCTIONS

Islamic state performs many functions, which shed light on its role. These are mentioned below:

1. Providing Basic Necessities

It is the first and foremost duty of the state to provide necessities of life to the mass. That is clothing, sheltering and feeding facilities. No one remains, hungry, unhoused, unclothed in the country.

2. Social and Economic Justice

Adil and Wal-Ihsan are important tools of economic programmes. There should be balance among all sects irrespective of caste, creed or colour. No distinction should made as regards, employment and economic development.

3. Freedom

Everyone is permitted to select a profession of his choice or he can conduct any kind of business within limits. He can earn his livelihood, support his family. But distinction is made between halal and haram.

4. Principles

Islamic s ate should lay down some guiding principles for spending. Lavish type of life must be prohibited, simple style be popularized and no one be allowed to spend more than his income.

5. Helping Weak Person

If there are some individuals who are economically weak and are not able to pull on, the state must take suitable measures for helping them. Similarly needy, crippled and some other of this type, should be helped by the government. Some schemes of social security be launched within the country.

6. Safe Guard against Exploitation

Some powerful zamindars, industrialists and monopolists encroach upon the rights of labouring class. They are not given due share of their labour. Hence, state should intervene and protect them from exploitation.

7. Controlling Prices

Prices should remain under safe limits, otherwise they pose many difficulties for common people. There should be neither inflationary nor deflationary pressure in the economy. It is the duty of the Muslim State to keep vigilant eye on price increase.

8. Utilization of Resources

The natural and human resources are very significant for achieving economic growth. The state shouid make maximum utilization of these resources. New resources are explored. Educational and training facilities are provided to people, so as to make them effective and honest.

9. Balance between Private and Public Sectors

If balance is not maintained between these two sectors, there is danger of many evils to take roots in the society therefore Islamic state keeps the balance.

Budget Surplus and Budget Deficit

When a government's income exceeds its expenditure and there is negative public sector debt repayment (PSDR) we say that government is running a budget surplus. On contrary when a government's expenditure exceeds its income so that it must borrow to make up the difference there is public sector debt repayment (PSDR) and we say that government is running a budget deficit.

Fiscal Policy and the Budget

Fiscal policy stresses that a government must plan for public expenditure and public borrowing to increase the income, it is necessary to make a plan for public revenue (Taxation). This formal planning by the government is done once in a year. **The taxation aspects are set out in the budget.**

Budget Imp

It is a financial statement which predicts the income and expenditure for the coming financial year and it gives report on article revenue and expenditure during year which has ended.

The budget is divided into two main parts (a) the revenue budget and (b) the capital budget.

The Revenue Budget

The revenue budget is an account of the anticipated public revenue and the proposed public expenditure for the coming Fiscal year. The receipt side gives details of income to be received from taxes and non-taxes sources while the expenditure side gives details of running expenditures of the government, administration, defence and social services such as education, health and means of transportation and communication.

Tax Revenue

It includes tax on income and wealth custom duties, excise duty, sales tax, general sales tax and surcharges.

Non-tax Revenue Sources

These non-tax revenue sources are income from property and enterprise, profit from different services provided by the government e.g., electricity, telephone, postal etc., trading profits e.g., profits of state owned corporations interest receipts from various autonomous bodies.

Current Expenditures

The main heads of the expenditure of the government are general administration, defence expenditures, law and order, community and economic services subsidies and debt servicing.

The Capital Budget

The capital budget is an account of the capital receipts and payments the receipt side gives detail about internal sources and external sources.

Internal Resources

Internal resources are consisting of recoveries of investment, state trading, federal miscellaneous investment, recoveries of loan and advances, domestic debt, unfounded debt (e.g., receipts from post offices saving bank deposits, saving certificates etc.,), deposits bearing interest (provident funds etc.,) and deposits not bearing interest.

External Resources

The external resources are placed namely-project aid, commodity and food aid and other aid.

A Specific Indirect Tax

i.e., a fixed amount per unit of output.

In Ad-valorem Indirect Tax

i.e., % age of the selling price.

Tax Incidence

Refers to the burden of a tax the more price inelastic the demand for a good, the greater the incidence falling on the consumer and more price elastic the demand for a good, the greater the incidence falling on the producer.

AD-VALOREM TAX

Ad-valorem Tax

When the amount of a tax is the percentage of the total income, is called ad-valorem tax.

Subsidy

Subsidy is a discount on price given by the government the more price inelastic the demand for a good the greater the share of the subsidy going to the consumers and vice versa.

SHORT QUESTION ANSWER

Q.1 Define inflation.

Ans. **Inflation:** A persistent rise in price, level is known as inflation or when there is a continuous rise in general price level is denoted by inflation or when too much money is chasing two few goods it is known as inflation.

Q.2 What are the economic policy objectives?

Ans. **Economic Policy Objectives:**

(i) To achieve economic growth and high per capita income without inflation.

(ii) To control inflation and deflation.

(iii) To achieve full employment.

(iv) To correct the balance of payments of a country.

Q.3 What are the policy instruments to achieve economic policy objectives?

Ans. **Policy instruments to achieve the economic policy objectives:**

(i) Fiscal policy

(ii) Monetary policy

(iii) Price and income policies

(iv) Exchange rate policy

(v) Foreign trade policy

Q.4 What are the three elements of fiscal policy?

Ans. **Three elements of fiscal policy:**

(i) Public expenditure

(ii) Public revenue

(iii) Public debit (includes public borrowings and public bendings)

Q.5 Define PSBR and PSDR.

Ans. **PSBR and PSDR:** The PSBR refers to public sector borrowing requirement and PSDR refers to public sector debt repayments PSBR is the amount that the government must borrow each year. A negative PSBR is called PSDR or PSDR arises when the government raises more income than expenditures surplus income is used to repay some of the national debts.

Q.6 What is a business cycle?

Ans. **Business Cycle:** Business cycles are recurrent non-periodic variations in the economy's real gross national product.

Q.7 Define multiplier.

Ans. **Multiplier:** Multiplier is the coefficient relating to an increment of investment to an increment of income, i.e., $k = \Delta Y/\Delta I$.

Q.8 Define principle of accelerator.

Ans. **The Principle of Accelerator:** It explains the increase (decrease) in investment on capital goods because of an increase (a decrease) in demand for consumer goods. It is also written as $\beta = \Delta I/\Delta C$ or $\Delta I = \beta \Delta C$.

Q.9 Define public finance what are its braches.

Ans. **Public Finance:** In public finance we study the collection of revenue and expenditure by the state. Public finance can be divided into three branches:

(a) Public Expenditure

(b) Public Revenue

(c) Public Debit

Q.10 Differentiate private finance and public finance.

Ans. **Private and Public Finance:** The management of personal and private income to make certain and specified expenditures is known as private finance while state management of its revenue and expenditure is public finance.

Q.11 What are the main sources of revenue for the federal government?

Ans. **Sources of Revenue of a Government:** The main sources of revenue for a government are taxes, fees, fines, prices, grants, gifts, income from government property and local rate.

Q.12 What are the main heads of expenditure for the federal government?

Ans. **Heads of Government Expenditures:** The main heads of government expenditures are:

(a) Defence

(b) Police

(c) Courts

(d) Civil administration

(e) Education

(f) Public health

(g) Transport & Communication

(h) Energy

(i) Interest

Q.13 Differentiate direct tax and indirect tax.

Ans. **Direct and Indirect Taxes:** A direct tax is really paid by the person on whom it is legally imposed, while an indirect tax is imposed on one person, but paid partly or wholly by another.

Q.14 Differentiate proportional tax and progressive tax.

Ans. Proportional and Progressive Taxation: Under proportionate tax, rate of tax remains same as the base is changed.

Taxation is said to be progressive when the rate of tax increases as the tax base increases and tax rate decreases with the decrease in income.

Cannons of taxation refer to the administrative aspects of a tax. They relate to the rate, amount, and method to levy and collection of a tax.

Q.15 What are four cannons taxation?

Ans. Four Cannons Taxation: Adam Smith has stated four cannons or maxims of taxation:

1. The cannon of equality
2. The cannon of certainty
3. The cannon of convenience, and
4. The cannon of economy.

Q.16 Define fiscal policy.

Ans. Fiscal Policy: Fiscal policy refers to the taxing, spending and borrowing policy of the government. It is mainly concerned with the process of shaping, Government revenue and govt. expenditure so as to achieve certain important, specific and main objectives.

Q.17 What are the long run objectives of a fiscal policy?

Ans. The long run objectives of Fiscal Policy are:

(i) High level of employment

(ii) Stabilization of price level

(iii) Reduction in inequality of income

Q.18 What is meant by Zakat?

Ans. Zakat: The word Zakat means to purify, to grow and to improve. It refers to the purification of soul, character, life and wealth, which is acquired after the payment of Zakat.

Q.19 Differentiate budget surplus and budget deficit.

Ans. Budget Surplus and Budget Deficit: When a government's income exceeds its expenditure, we say that government is running a budget surplus. On contrary when a government's expenditure exceeds its income. We say that government is running a budget deficit.

Q.20 Define budget.

Ans. Budget: It is a financial statement which predicts the income and expenditure for the coming financial year and it gives report on revenue and expenditure during year which has ended.

Q.21 Define revenue budget.

Ans. **The Revenue Budget:** The revenue budget is an account of the anticipated public revenue and the proposed public expenditure for the coming fiscal year.

Q.22 What is tax revenue?

Ans. **Tax Revenue:** It includes tax on income and wealth custom duties, excise duty, sales tax, general sales tax and surcharges.

Q.23 What are non tax revenue sources?

Ans. **Non-tax Revenue Sources:** These non tax revenue sources are income from property and enterprise, profit from different services provided by the government e.g., Electricity, Telephone, postal etc., trading profits e.g., profits of state owned corporations interest receipts from various autonomous bodies.

Q.24 What are the main heads of government; current expenditures?

Ans. **Current Expenditures:** The main heads of the expenditure of the government are general administration, defence expenditures, law and order, community and economic services subsidies and debt servicing.

Q.25 Define capital budget.

Ans. **The Capital Budget:** The capital budget is an account of the capital receipts and payments the receipt side gives detail about internal sources and external sources.

Q.26 What are the internal and external sources for the government?

Ans. **Internal Resources:** Internal resources are consisting of recoveries of investment, state trading, federal miscellaneous investment, recoveries of loan and advances, domestic debt, unfounded debt (e.g., receipts from post offices saving bank deposits, saving certificates etc.,), deposits bearing interest (provident funds etc.,) and deposits not bearing interest.

External Sources: The external resources are placed namely: project aid, commodity and food aid and other aid.

EXERCISE

Q.1 Discuss the main characteristics of a good tax system?

Q.2 Define and differentiate:

(a) Direct tax and indirect tax.

(b) Progressive tax and proportionate. Give their advantages?

Q.3 Discuss the Principles or Cannons of Taxation?

Q.4 What is Fiscal Policy? Discuss the major objective of Fiscal Policy. Also discuss the principle weapons or tools of Fiscal Policies?

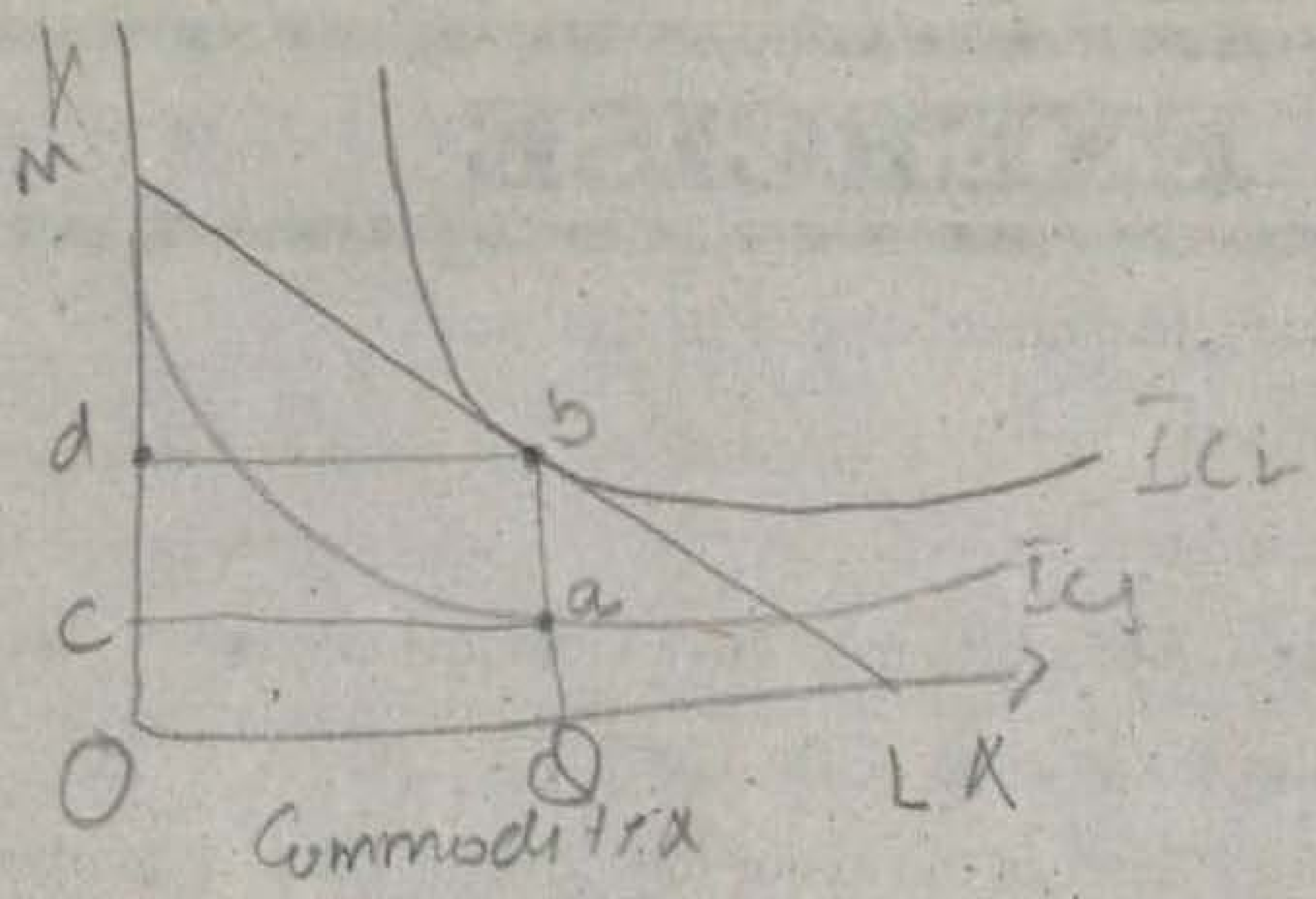
Q.5 What is Zakat? Discuss its role in fiscal system of Islam.

OR

Zakat is religious obligation. Explain its utility or importance. How do you differentiate it from Tax?

Q.6 Discuss functions of State in Islam?

✿ 14 ✿



MC − Md = Cd

$Y = 6 + 9x + 10z^2$

x, y, z = variables

6 = constant

9, 10 = Paremeter



CHAPTER

15 MATHEMATICAL ECONOMICS

VARIABLES

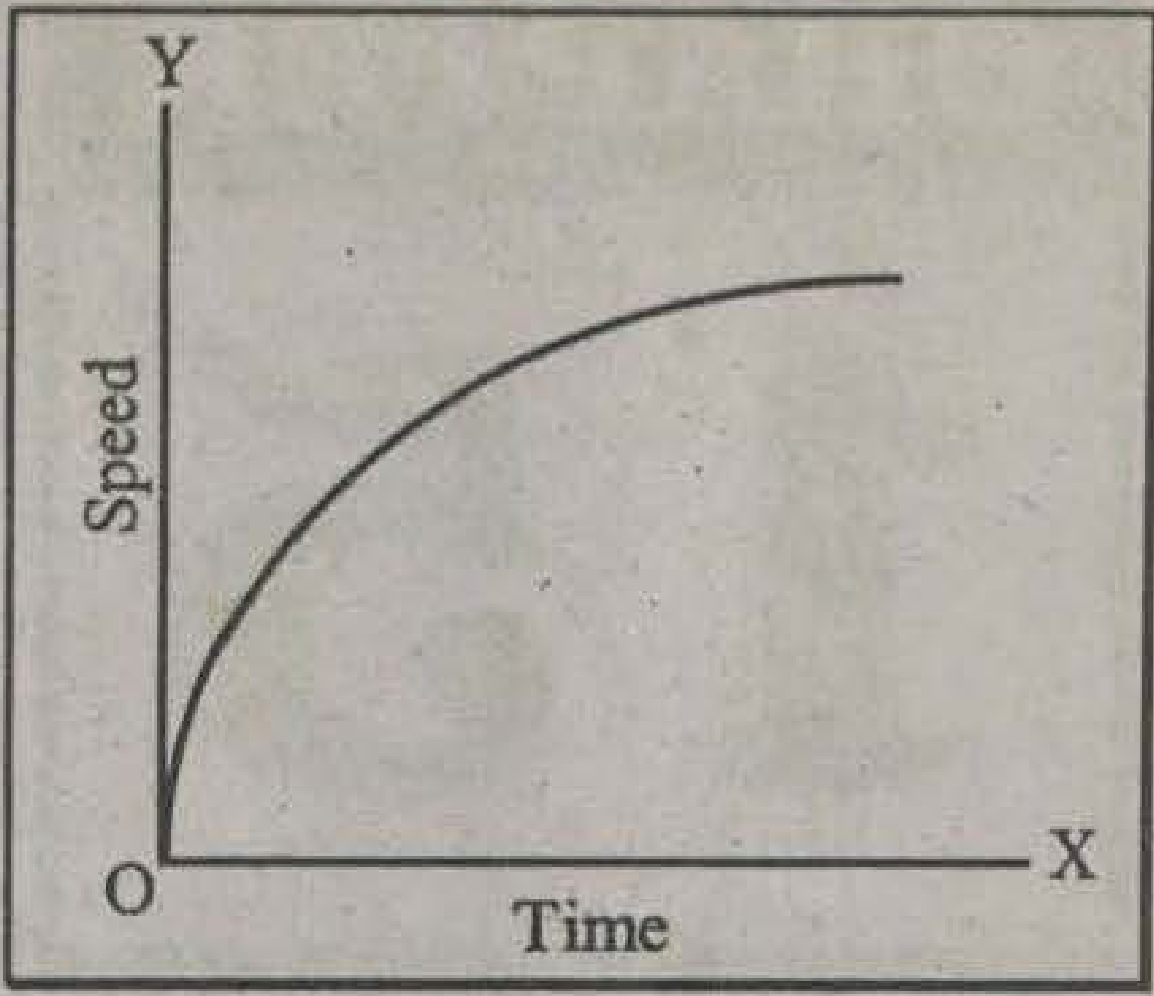
A variable ranges over a set of possible values within a given problem. In the equation $Q_d = a - bp$ Qd and p are variables. A variable is define as "A variable is a symbol which during a discussion may assume different values or set of admissible values". Or a variable number is any number, an unspecified number, from a certain given set of real numbers and it is always symbolized by a letter such as x, y and z.

In our daily life we feel many variables whose value change e.g., speed, temperature. During the study of economics we also face large number of variables. For example: price, demand, supply, saving investments, income, consumption, rate of interest, rent, wages, profits, utility cost of production, output, import, exports etc., In economics we not only analyse these variables but also explain their inter-relationship. In Mathematics, variables are generally symbolised by a letter such as x, y and z. In economics we normally use the first letter of the English names of the variable, e.g., 'D' for Demand, 'P' for Price, I for investment, C for Consumption, R for Rent, U for Utility etc., but it is not always a necessary condition. Sometimes we use different words to symbolize the variable e.g., Y for income, M for imports, X for exports, 'I' for interest and G for Government expenditure. In a discussion, all possible values which any variable can adopt is called its range and the minimum value is called the lower limit of the range and maximum value is called the upper limit of the range e.g., price of wheat was Rs. 40/= Per 40 Kg in 1980 which has moved now to Rs. 450/= Per 40 Kg. The lower limit is Rs. 40 and the upper limit is Rs. 450 and the range is from Rs. 40 to Rs. 450.

CONTINUOUS AND DISCONTINUOUS VARIABLES

"A continuous variable is a variable which has the ability to adopt each and every value within its range and there is no gap, interval or jump" or " a variable is continuous if its range is either the whole set of real numbers or any interval of the set". The values of a continuous variable can be ordered so that they are indefinitely dense and without gaps. It is often convenient, for example, to think of a continuous variable as taking values successively in increasing order of magnitude and we describe this by saying that

the variable increases continuously in value over such and such an interval. We can give examples of continuous variables from an daily life e.g., temperature, speed etc., A continuous variable can be graphed as below:

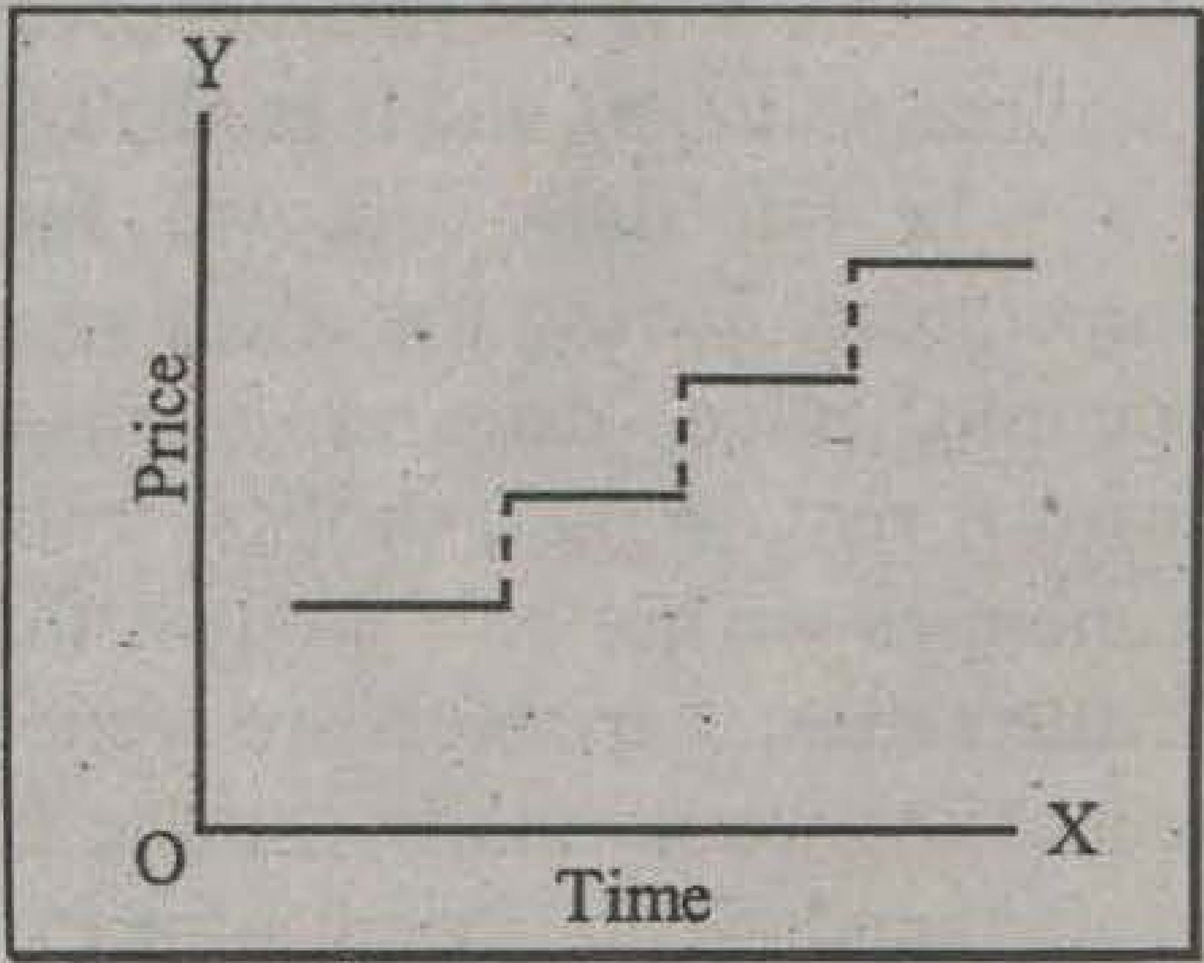


The graph shows that there is no gap, jump or interval in the speed. We cannot give examples of continuous variable from economics because all the variables which are used in economics are discontinuous.

"A discontinuous variable is a variable which does not adopt each and every value within its range and hence there is a gap, jump and an interval. or "a discontinuous variable has a range which is neither the whole set of real numbers nor any interval of the set. The values of such as variable cannot be arranged in order of magnitude without gaps".

All the variables used in economics are discontinuous e.g., price, output, investment, savings, consumption, income population, cost of production, imports, exports etc.,

A discontinuous variable can be graphed as below:



INDEPENDENT AND DEPENDENT VARIABLES

"A variable whose value is determined independently of outside the equation is called the independent variable. It appears on the right hand side (RHS) of the equality sign in an equation. In a demand function $Q_d = f(p)$, Price is independent variable, in utility function $U = f(Q)$ quantity 'Q' is independent variable because its value changes independently.

Note: "A function, such $Y = f(x)$ expresses a, relationship between two variables (x, y) such that for there exists one and only one value of Y".

"A variable whose value is not determined independently of, outside the equation is called the dependent variable". Or a variable whose value depends on the values of some other variables. It appears on the left hand side (LHS) of the equality sign in the equation. In a demand function $Q_d = f(p)$, quantity demanded (Q_d) is dependent and P is independent variable, in investment function $I = f(C)$ 'Y' is an independent and I is dependent variable.

CONSTANTS AND PARAMETERS

"A constant is a quantity that does not change in a given problem". A numerical constant has the same value in all problems. A quantity which remains constant in a given context is called the parameter". or "a variable which is assumed to be constant in an economic discussion i.e., has the same value within a given problem but may assume other values in different problems". In a consumption function C = Ca + cY, Ca is constant (Ca, means the autonomous consumption) and small 'c' attached with Y is parameter (c denotes marginal propensity to consume). In a given consumption function c (MPC) remains constant but it may assume different values in some other different problems. In a function I = Ia + IY, Ia is autonomous investment and is a constant 'I' attached with Y represents marginal propensity to invest and is parameter.

In economics all the assumptions conditions in economics laws and theories are parameters e.g., in law of demand income of consumer, price of the substitutes, new substitutes, are parameters. In the law of diminishing return, homogenous unit of variable factor of production, improvement in technique of production, are parameters etc.,

FUNCTION

A function expresses a relationship between two variables x, y (where x, is an independent variable and Y is a dependent variable) such that for each value of x, there exists one and only one value of Y, or a function is a specific type of relation between independent variable x and dependent variable Y where for one value of x there is definite one value of Y.

EXAMPLE

Demand function, supply function, utility function, savings functions etc., which are shown as $q_d = f(p)$, $q_s = f(p)$, $u = f(Q)$, $s = f(Y)$ etc.,

RELATION

"If for one value of independent variable 'x' there are more than one values of dependent variable Y then the relationship between these two variables is called relation or mapping.

KINDS OF FUNCTION

1. LINEAR FUNCTION

If in a function the maximum power of an independent variable is one is said to a linear function and the graph turns out to be a straight line.

EXAMPLE

$Y = ax + b$

$q_d = 10 - P$ Demand function

$q_s = 15 + 2p$ Supply function

2. QUADRATIC FUNCTION

A function of the form $f(x) = ax^2 + bx + c$, is called a quadratic function i.e., if the maximum of an independent variable is two it is known as quadratic function.

EXAMPLE

$$C = q^2 + 10q + 30 \quad \text{(short period cost function)}$$

GRAPH

The graph of a quadratic function is either U-shaped or inverted ∪-shaped i.e., ∩.

3. POLYNOMIAL FUNCTION

A function like $f(x) = ax^4 + bx^3 + cx^2 + dx + c$ is a polynomial function i.e., where the power of an independent variable is more than two.

4. POWER FUNCTION

A function like $Y = x^2$ is a power function i.e., the base is an independent variable and power is constant.

5. EXPONENTIAL FUNCTION

A function like $Y = 2^x$ is an exponential function i.e., the base is constant and the power is variable.

6. LOGARITHMIC FUNCTION

If in a function the value of dependent variable Y is equal to the logarithmic of independent variable x whose base is constant is called a logarithmic function which is written as under.

$$Y = \log_{10}^{x}$$

7. SINGLE VALUED FUNCTION:

If in a function there is only one value of dependent variable Y with a change in independent variable x, the function is known as single valued function e.g., $q = 10 - p$ for each value of p there is one value of q.

8. MULLI-VALUED FUNCTION

If in a function there are more than one values of dependent variable Y for one value of independent variable x $Y = 3x^2 + 5x + 2$ is called a multi valued function.

9. EXPLICIT FUNCTION

If in a function a dependent variable totally depends on the independent variable the function is called the explicit function e.g., demand function, supply function, saving function, consumption function. In the above functions q_d, q_s, s and c are totally depending on prices and income respectively.

10. IMPLICIT FUNCTION

If in a function a dependent variable does not totally depend on independent variable the function is called an implicit function e.g.,

$$I = f(y) \quad \text{and}$$
$$Y = f(I)$$

11. INCREASING FUNCTION

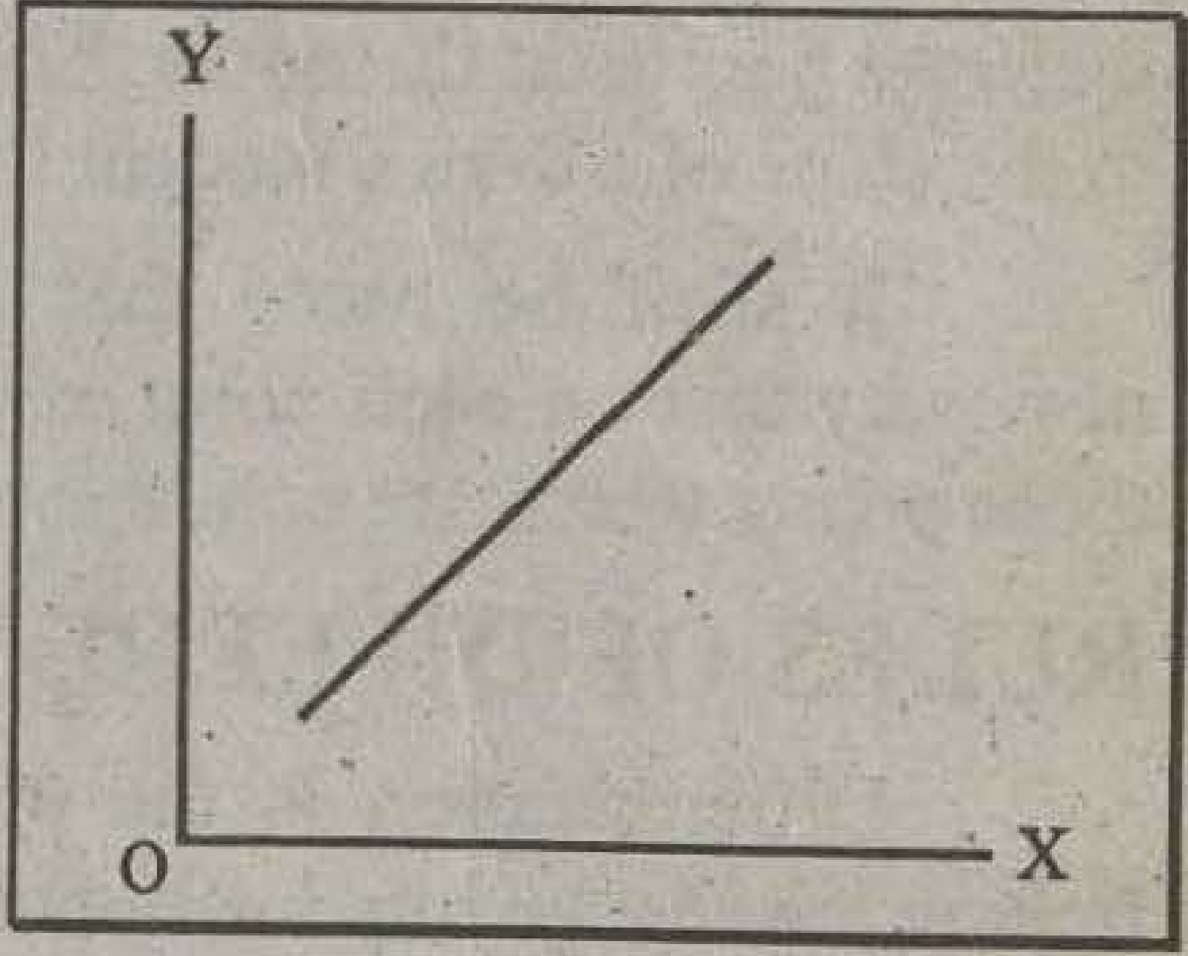
"If in a function the direction of the change in dependent variable is the same as of independent variable is called increasing function i.e., if there is an increase or decrease in x there is increase and decrease in Y respectively.

EXAMPLE

$$S = f(y) \quad , \quad c = f(y)$$

GRAPH:

The graph of an increasing function is always upward moving.

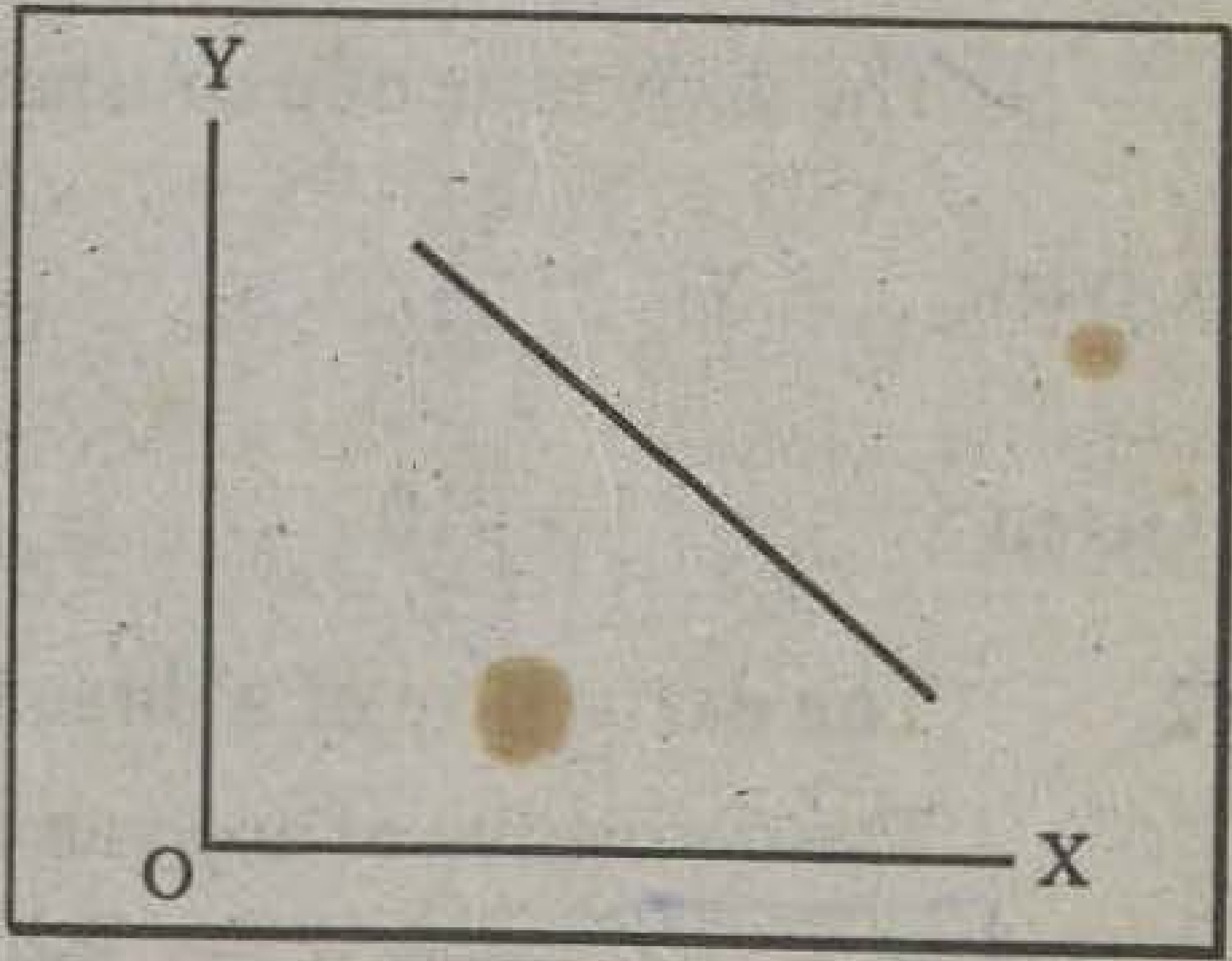


12. DECREASING FUNCTION

If a function of the direction of change in dependent variable is not the same as of independent variable is called decreasing function e.g.,

$q_d = f(p)$, $u = f(Q)$.

The graph is always moving document i.e., from left to right.



13. INVERSE FUNCTION

All these functions which can be expressed in their reverse functions are called inverse functions e.g.,

$$I = f(y) \quad , \quad Y = f(I)$$

It is written as

$$Y = f^{-1}(x)$$

DERIVATIVES

The derivative measures the instantaneous rate of a change of a function i.e., how the dependent variable changes for a very small unit change in the dependent variable. The formal terminology of for the derivative is

$$\frac{dy}{dx} = \lim_{\Delta x \to o} \frac{\Delta y}{\Delta x}$$

Here dy/dx is a combined expression which reads; the derivative of y unit respect to x; it equals the limit of the ratio $\Delta y/\Delta x$, as Δx approaches zero. The derivative measures the slope of the function and particularly slope of culvinear function.

The average rate of change (dy/dx) for a linear function is constant and is equal to the slope. But the average rate of change for a culvinear function varies with successive move along the curve. Thus the slope if a culvinear function is not constant. It varies at different points on the curve. The slope of a culvinear function at any given point is equal to the slope of a drawn tangent to the curve at that point.

It shall be noted that only continuous functions have derivatives. It is not necessary that on each point of a function derivative exists. The derivative only exists at those points which are continuous.

RULES OF DIFFERENTIATION

Differentiation is the process of determining the derivative of a function i.e., finding the change in y for a change in x when the change in x (Δx) approaches zero.

1. **The Constant Function Rule**

The derivative of a constant function y = k, where k is any constant, is zero.

Given $y = k$, $\frac{dy}{dx} = 0$

Given $y = 10$, $\frac{dy}{dx} = 0$

2. **The derivative of a linear function**

The derivative of any variable with respect to itself is unity.

If $y = x$ when $y = f(x)$

$$\frac{dy}{dx} = \frac{d}{dx}(x) = 1$$

or the derivative of a linear function $y = a + bx$ is equal to be, the co-efficient of x.

Example:

Given $y = 5 + 10x$, $\frac{dy}{dx} = 10$

$$y = 3 + 9x, \quad \frac{dy}{dx} = 9$$

$$y = 11x + 13, \quad \frac{dy}{dx} = 11$$

3. The Power Rule

If $f(x) = ax^n$ where a and n are any two numbers then $\frac{dy}{dx} = a.n.x^{n-1}$ i.e., we multiply the power with the co-efficient of the variable and then reduce power by one OR the derivative of a power function $y = ax^n$, is equal to the exponent n, times. The co-efficient a, multiplied the variable x raised to n^{-1} power.

Example: $y = 12x^2 \quad \frac{dy}{dx} = \frac{d}{dx}(12x^2)$

$$12.2\,x^{2-1} = 24x$$

$$y = 3x^4 \quad \frac{dy}{dx} = \frac{d}{dx}(3x^4)$$

$$= 3.4\,x^{4-1} = 12\,x^3$$

$$y = x^5 \quad \frac{dy}{dx} = \frac{d}{dx}(x^5)$$

$$= 5x^{5-1} = 5x^4$$

4. The Rule of Sums and Differences

The derivative of a sum, is equal to the sum of the derivatives of the individual functions. The derivative of difference is equal to the difference of the derivatives of the individual functions.

Given $\quad y = u(x) \pm v(x); \ \frac{dy}{dx} = \frac{du}{dx} = \pm \frac{dv}{dx}$

Example: Given $y = 12x^4 - 4x^3$

Take $\quad 12x^4 = u$ and $4x^3 = v$

$$\frac{dy}{dx} = \frac{d}{dx}(u-v) = \frac{du}{dx} - \frac{dv}{dx}$$

$$\frac{dy}{dx} = \frac{d}{dx}(12x^4 - 4x^3)$$

$$\frac{dy}{dx} = \frac{d}{dx}(12x^4) - \frac{d}{dx}(4x^3)$$

$$\frac{dy}{dx} = 48x^3 - 12x^2$$

Given: $Y = 8x^2 + 3x,$

$$\frac{dy}{dx} = \frac{d}{dx}(8x^2 + 3x)$$

$$\frac{dy}{dx} = \frac{d}{dx}(8x^2) + \frac{d}{dx}(3x)$$

$$\frac{dy}{dx} = 16x + 3$$

5. The Product Rule

The derivative of a product, $y = u(x) \cdot v(x)$ is equal to the first function multiplied by the derivative of the second function plus the second function multiplied by the derivative of the first function. Exponents are added during multiplication.

Given: $y = u(x) \cdot v(x)$

$$\frac{dy}{dx} = u\frac{dv}{dx} + v\frac{du}{dx}$$

Example: $y = (3x^2 + 5)(6x^3 + 4x + 2)$

$$\frac{dy}{dx} = (3x^2 + 5)\frac{d}{dx}(6x^3 + 4x + 2) + (6x^3 + 4x + 2)\frac{d}{dx}(3x^2 + 5)$$

$$\frac{dy}{dx} = (3x^2 + 5)(18x^2 + 4) + (6x^3 + 4x + 2)(6x)$$

$$\frac{dy}{dx} = 54x^4 + 90x^2 + 12x^2 + 20 + 36x^4 + 24x^2 + 12x$$

$$\frac{dy}{dx} = 90x^4 + 126x^2 + 12x + 20$$

6. The Quotient Rule

The derivative of a quotient $y = \frac{u}{v}$ is equal to denominator 'v' multiplied by the derivative of numerator 'u' minus numerator multiplied by the derivative of denominator all divided by 'v' square.

Given: $y = \frac{u(x)}{v(x)}, \frac{dy}{dx} = \frac{v(du/dx) - u(dv/dx)}{v^2}$

The order in the numerator of the formula for the derivative is important and cannot be reversed. Exponent are subtracted during division.

Example: $y = \frac{4x^2}{5x+3}$

$$\frac{dy}{dx} = \frac{(5x+3)\frac{d}{dx}(4x^2) - (4x^2)\frac{d}{dx}(5x+3)}{(5x+3)^2}$$

$$\frac{dy}{dx} = \frac{(5x+3)(8x) - (4x^2)(5)}{(5x+3)^2}$$

$$\frac{dy}{dx} = \frac{40x^2 + 24x - 20x^2}{(5x+3)^2}$$

$$\frac{dy}{dx} = \frac{20x^2 + 24x}{(5x+3)^2} \text{ or } \frac{dy}{dx} = \frac{4x(5x+6)}{(5x+3)^2}$$

7. **The Rule for a function of a function**

The derivative $\frac{dy}{dx}$ of a function $y = f(u)$ and $u = g(x)$ is equal to the derivative of the first function with respect to 'u' times the derivative of the second function with respect to x.

Given: $y = f(u),\ u = g(x)$

$$\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$$

Example: $y = (2x^2+3)^4$

Take care, $2x^2 + 3 = u$

So $y = (u)^4$

$$\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$$

$$\frac{dy}{du} = \frac{d}{du} \cdot (u^4)$$

$$\frac{dy}{du} = 4u^3)$$

By putting the value of u

$$\frac{dy}{du} = 4(2x^2+3)^3$$

$$\frac{du}{dx} = \frac{d}{dx}(2x^2+3)$$

$$\frac{du}{dx} = 4x$$

So $\frac{dy}{dx} = 4(2x^2+3)^3 (4x)$

$$\frac{dy}{dx} = 16x\,(2x^2+3)^3 \quad \left(\text{As } \frac{dy}{dx} = 4\,(2x^2+3)^3 \text{ and } \frac{du}{dx} = 4x\right)$$

8. High Order Derivative

The second order derivative $\frac{d^2y}{dx^2}$ measures the rate of change of the first derivative, just as the first derivative $\frac{dy}{dx}$ measures the rate of change of the original function. The third order derivative $\frac{d^3y}{dx^3}$ measures the rate of change of the second derivative etc., These derivatives are written as above.

Example: $y = 5x^4 + 4x^3 + 3x^2$

$$\frac{dy}{dx} = \frac{d}{dx}(5x^4 + 4x^3 + 3x^2)$$

$$\frac{dy}{dx} = 20x^3 + 12x^2 + 6x$$

Second order derivative

$$\frac{d^2y}{dx^2} = \frac{d}{dx}(20x^3 + 12x^2 + 6x)$$

$$\frac{d^2y}{dx^2} = 60x^2 + 24x + 6$$

Third order derivative

$$\frac{d^3y}{dx^3} = \frac{d}{dx}(60x^2 + 24x + 6)$$

$$\frac{d^3y}{dx^3} = 120x + 24$$

PARTIAL DERIVATIVES

Partial derivatives are found by differentiating the function with respect to one variable while keeping the other independent variable constant. The symbol used for partial derivative is ∂ (curly instead of d as in normal derivatives) so partial derivative is written as $\frac{\partial y}{\partial x}$

Example: Find the partial derivative with respect to y of the following function.

$$z = 5x - 4y + 3$$

$$\frac{\partial z}{\partial y} = \frac{\partial}{\partial y}(5x - 4y + 3)$$

$$\frac{\partial z}{\partial y} = -4$$

Model Question-1:

Given a following demand function of a market.

Qd = 50 – 4P + 0.05y when Y = 10,000 and P = 40

(a) Find price elasticity of demand

(b) Find income elasticity demand

Solution:

(a) Price elasticity of demand is

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

We can find the 'q' putting the values of P and Y in the equation.

$$Qd = 50 - 4(40) + 0.05(10{,}000)$$

$$Qd = 50 - 160 + 500 \quad \Rightarrow 390$$

Now we find the partial derivative $\frac{\partial q}{\partial p}$

$$\frac{\partial q}{\partial p} = \frac{\partial}{\partial p}(50 - 4P + 0.05y)$$

$$\frac{\partial q}{\partial p} = -4 \quad \text{(Keeping 0.05y Constant)}$$

$$E = \frac{\partial q}{\partial p} \cdot \frac{p}{q} = -4 \times \frac{40}{390} = -0.41$$

Now of find partial derivative $\frac{\partial q}{\partial y}$

$$\frac{\partial q}{\partial y} = \frac{\partial}{\partial y}(50 - 4p - 0.05y)$$

$$\frac{\partial q}{\partial y} = 0.05$$

Income elasticity of demand

$$E_y = \frac{\partial q}{\partial y} \cdot \frac{y}{q}$$

$$E_y = 0.05 \cdot \frac{10000}{390} = 1.28$$

Model Question-2:

Given the following demand function:

$Q_d = 700 - 2P + 0.02y$ when $P = 25$ and $y = 5000$

(a) Find Price elasticity of demand.

(b) Find Income elasticity of demand.

Solution:

(a) $Q_d = 700 - 2P + 0.02y$

Put the values of P and y

$$Q_d = 700 - 2(25) + 0.02(5000)$$

$$700 - 50 + 100 \Rightarrow 750$$

Find the partial derivatives $\frac{\partial q}{\partial p}$

$$\frac{\partial q}{\partial p} = \frac{\partial}{\partial p}(700 - 2P + 0.02y)$$

$$\frac{\partial q}{\partial p} = -2$$

$$E = \frac{\partial q}{\partial p} \cdot \frac{p}{q}$$

$$E = -2 \times \frac{25}{750} \Rightarrow -0.067$$

Find the partial derivatives $\frac{\partial q}{\partial y}$

$$\frac{\partial q}{\partial y} = \frac{\partial}{\partial y}(700 - 2P + 0.02y)$$

$$\frac{\partial q}{\partial y} = 0.02$$

$$\frac{\partial q}{\partial y} \cdot \frac{y}{q}$$

$$E = 0.02 \times \frac{5000}{750} = 1.33$$

THE USE OF DERIVATIVES IN ECONOMICS

Application of derivatives to the concept of elasticity of demand and supply.

Model Question-3:

Find the Elasticity of demand of the following functions when $P = 3$ and 5

(a) $Q = 75 - 5p$ (b)$40 - 2p$

(c) $Q + 3p = 50$ (d)$3Q + 2p - 90 = 0$

Solution: Elasticity of demand is measured with the help of the following formula:

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

Where $\frac{dq}{dp}$ is the rate of change, p is price and q is quantity. If we put the price in the demand function we can find the value of Q.

(a) $Q = 75 - 5p$

Put $P = 3$ $Q = 75 - 5(3) \Rightarrow 60$

Put $P = 5$ $Q = 75 - 5(5) \Rightarrow 50$

$$\frac{dq}{dp} = \frac{d}{dp}(75 - 5p)$$

$$\frac{dq}{dp} = -5$$

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E = -5 \text{ x} \frac{3}{60} = \frac{-1}{4} \Rightarrow -0.25 \quad (\text{At } P = 3)$$

$$E = -5 \text{ x} \frac{5}{50} = \frac{-1}{2} \Rightarrow -0.5 \ (\text{At } P = 5)$$

So elasticity of demand at $P = 3$ is -0.25 and at $P = 5$ is -0.5

(b) $Q = 40 - 2p$

$$\frac{dq}{dp} = \frac{d}{dp}(40 - 2p)$$

$$\frac{dq}{dp} = -2$$

Put $P = 3$ $Q = 40 - 2(3) = 34$

Put $P = 5$ $Q = 40 - 2(5) = 30$

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E = -2 \cdot \frac{3}{34} = -0.176$$

$$E = -2 \cdot \frac{5}{34} = -0.333$$

So elasticity of demand at P = 3 is –0.176 and at P = 5 is –0.333

(c) $Q + 3p = 50$

Bringing the function into standard form i.e., $q = f(p)$

$$Q = 50 - 3p$$

$$\frac{dq}{dp} = \frac{d}{dp}(50 - 3p)$$

$$\frac{dq}{dp} = -3$$

At P = .3 $\quad Q = 50 - 3(3) = 41$

At P = 5 $\quad Q = 50 - 3(5) = 35$

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E = -3 \cdot \frac{3}{41} = 0.219$$

$$E = -3 \cdot \frac{5}{35} = -0.428$$

So elasticity of demand at P = 3 is –0.219 and at P = 5 is –0.428

(d) $3Q + 2p - 90 = 0$

Bring the function in the standard form

$$3Q = 90 - 2p$$

$$Q = 30 - \frac{2}{3}P$$

$$\frac{dq}{dp} = \frac{d}{dp}(30 - \frac{2}{3}P)$$

$$\frac{dq}{dp} = \frac{-2}{3} = -0.67$$

At P = 3 $\quad Q = 30 \frac{-2}{3}(37) = 28$

At P = 5 $\quad Q = 30 \frac{-2}{3}(5) = 26.67$

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E = -0.67 \cdot \frac{3}{28} = -0.072$$

$$E = -0.67 \cdot \frac{5}{26.67} = -0.125$$

So elasticity of demand at P = 3 is –0.072 and at P = 5 is –0.125

Model Question-4:

Find the elasticity of supply of the following functions when P =5 and 10.

(a) $Q = 5 + P$ (b) $Q = -2 + 0.8p$

(c) $Q - 1.5p + 3 = 0$

Solution: Elasticity of supply can be find with the help of the following formula:

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

(a) $Q = 5 + p$

$$\frac{dq}{dp} = \frac{d}{dp}(5 + p) = 1$$

At $P = 5 \quad Q = 5 + 5 = 10$

At $P = 10Q = 5 + 10 = 15$

$$E_s = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E_s = 1 \cdot \frac{5}{10} = \frac{1}{2} = 0.5$$

$$E_s = 1 \cdot \frac{10}{15} = \frac{2}{3} = 0.67$$

So elasticity of supply at P = 5 is 0.5 and P = 10 is 0.67

(b) $Q = -2 + 0.8p$

$$\frac{dq}{dp} = \frac{d}{dp}(-2 + 0.8p)$$

$$\frac{dq}{dp} = 0.8$$

At $P = 5 \quad Q = -2 + 0.8(5) = 2$

At $P = 10Q = -2 + 0.8(10) = 6$

$$E_s = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E_s = 0.8 \cdot \frac{5}{2} = 2$$

$$E_s = 0.8 \cdot \frac{10}{6} = 1.33$$

So elasticity of supply at P = 5 is 2 and at P = 10 is 1.33

(c) $Q - 1.5P + 3 = 0$

Bringing the supply function in the standard form

$$Q = 1.5P - 3$$

$$\frac{dq}{dp} = \frac{d}{dp}(1.5P - 3)$$

$$\frac{dq}{dp} = 1.5$$

At $P = 5 \quad Q = 1.5(5) - 3 = 4.5$

At $P = 10Q = 1.5(10) - 3 = 12$

$$E_s = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E_s = 1.5 \times \frac{5}{4.5} = 1.67$$

$$E_s = 1.5 \times \frac{10}{12} = 1.25$$

Model Question-5:

Given the following demand function.

(a) $Qd = 20 - 5P$ (b) $2P - Q = 5.5$

$Q_s = 4 + 3P$ $Q + P = 5$

(i) Find Equilibrium price and quantity

(ii) Find Elasticity of demand and supply at Equilibrium price and quantity.

Solution:

(a) (i) Equilibrium price is a price whose quantity demanded is equal to quantity supplied i.e.,

$$Q_d = Q_s$$

$$20 - 5P = 4 + 3P$$

$$-5P - 3P = 4 - 20$$

$-8P = -16$

$P = \frac{-16}{-8} = 2$

So Equilibrium price is 2

Put P =2 in demand or supply function to find the equilibrium quantity.

$Q_d = 20 - 5P \qquad Q_s = 4 + 3P$

$Q_d = 20 - 5(2) = 10 \qquad Q_s = 4 + 3(2) = 10$

That is Equilibrium quantity is 10

(ii) Elasticity of demand is given as

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

Now we find $\frac{dq}{dp}$

$$\frac{dq}{dp} = \frac{d}{dp}(20 - 5P) = -5$$

So $E = -5 \times \frac{2}{10} = -1$

That is elasticity of demand is unity.

Elasticity of supply is given as

$$E_s = \frac{dq}{dp} \cdot \frac{p}{q}$$

Now we find $\frac{dq}{dp}$

$$\frac{dq}{dp} = \frac{d}{dp}(4 + 3P) = 3$$

$$E_s = 3 \times \frac{2}{10} = 0.6$$

That elasticity of supply is less than unity.

(b) (i) $q + p = 5$ and $2P - q = 5.5$

Bringing the above equation in the standard form

$q = 5 - P$ and $q = 2P - 5.5$

Condition for equilibrium price

$Q_d = Q_s$

$5 - P = 2P - 5.5$

$$-P - 2P = -5.5 - 5$$
$$-3P = -10.5$$
$$P = \frac{-10}{-3} = 3.5$$

So Equilibrium price is 3.5

Put $P = 3.5$ in demand and supply function to find the Equilibrium quantity

$q = 5 - P \quad q = 2P - 5.5$

$q = 5 - 3.5 = 1.5 \; q = 2(3.5) - 5.5 = 1.5$

So Equilibrium quantity is 1.5

(ii) Now we find $\frac{dq}{dp}$ from both the functions to find the elasticity of demand and supply

$$\frac{dq}{dp} \cdot \frac{d}{dp}(5 - P) = -1 \qquad \frac{dq}{dp} = \frac{d}{dp}(2P - 5.5) = 2$$

$$\frac{dq}{dp} = -1 \qquad \frac{dq}{dp} = 2$$

Elasticity of demand

$$E_d = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E_d = -1 \times \frac{3.5}{1.5} = -2.33$$

$$E_d = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E_s = 2 \times \frac{3.5}{1.5} = 4.66$$

Model Question-6:

Given the following demand and supply functions:

(a) $Q_d = 250 - P - 4P^2$ (b)$Q_s = 200 + 4P^2$

Find Elasticity of demand and supply at $P = 2$ and 4

Solution: (a)Put $P = 2$ in demand function

$$Q_d = 250 - 2 - 4(2)^2 = 232$$

Put $P = 4$ in the demand function

$$Q_d = 250 - 4 - 4(4)^2 = 182$$

$$\frac{dq}{dp} = \frac{d}{dp}(250 - P - 4P^2)$$

$$\frac{dq}{dp} = -1 - 8P$$

Put $P = 2$ $\frac{dq}{dp} = -1 - 8(2) = -17$

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E = -17 \times \frac{2}{232} = -0.146$$

Put $P = 4$ $\frac{dq}{dp} = -1 - 8(4) = -33$

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E = -33 \cdot \frac{4}{182} = -0.725$$

(b) Put $P = 2$ in the supply function

$Q_s = 200 + 4(2)^2 = 216$

Put $P = 4$ $Q_s = 200 + 4(4)^2 = 264$

Now we find $\frac{dq}{dp}$

$$\frac{dq}{dp} = \frac{d}{dp}(200 + 4P^2) = 8P$$

Put $P = 2$ $\frac{dq}{dp} = 8(2) = 16$

$$E_s = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E_s = 16 \cdot \frac{2}{216} = 0.148$$

Put $P = 4$ $\frac{dq}{dp} = 8(4) = 32$

$$E_s = \frac{dq}{dp} \cdot \frac{p}{q}$$

$$E_s = 32 \cdot \frac{4}{264} = 0.484$$

Model Question-7:

Given the following demand function

$$P_Q = 1600$$

(a) Find the price Elasticity of demand.

(b) Prove that when the demand function is $P_Q = n$ where 'n' is a constant, the Elasticity is always equal to unity.

Solution: $P_Q = 1600$

Bringing the demand function in the standard form

$$Q = \frac{1600}{P}$$

If $P = 1 \quad Q = 1600$

$P = 2 \quad Q = 800$

$P = 4 \quad Q = 400$

$$E = \frac{dq}{dp} \cdot \frac{p}{q}$$

Now we find $\frac{dq}{dp}$ from the demand function $Q = \frac{1600}{P}$ we can write the demand function as $Q = 1600\, P^{-1}$ so

$$\frac{dq}{dp} = \frac{d}{dp}(1600\, P^{-1})$$

$$\frac{dq}{dp} = -1600\, P^2 \text{ or } \frac{dq}{dp} = \frac{-1600}{P^2}$$

If $P = 1 \quad \frac{dq}{dp} = \frac{-1600}{(1)^2} = -1600$

$$E = -1600 \cdot \frac{1}{1600} = -1$$

If $P = 4 \quad \frac{dq}{dp} = \frac{1600}{(4)^2} = \frac{-1600}{16} = -100$

$$E = -100 \times \frac{4}{400} = -1$$

(b) $P_Q = n$

or $Q = \frac{n}{P} = nP^{-1}$

$$\frac{dq}{dp} = -nP^{-2} \text{ or } \frac{-n}{P^2}$$

$$E = \frac{-n}{P^2} \cdot \frac{p}{q} = \frac{-n}{Pq}$$

And Pq = n as mentioned in the question

$$E = \frac{-n}{n} = -1$$

So when the demand function is $P_Q = n$, where 'n' is a constant. The Elasticity is always equal to one.

Model Question-8:

Given the following demand function

$$P_Q = 1200$$

(a) Find the price Elasticity of demand

(b) Prove that when the demand function is $P_Q = n$ where 'n' is a constant the elasticity is always to one.

Solution: $P_Q = 12000$

Bring the demand function in the standard form

$$q = f(P)$$

$$Q = \frac{1200}{P}$$

or $Q = 1200\,P^{-1}$

If $P = 1 \quad Q = \frac{1200}{1} = 1200$

$P = 2 \quad Q = \frac{1200}{2} = 600$

$P = 3 \quad Q = \frac{1200}{3} = 400$

Now we find $\frac{dq}{dp}$

$$\frac{dq}{dp} = \frac{d}{dp}(1200\,P^{-1})$$

$$\frac{dq}{dp} = -1200\,P^{-1} \text{ or } \frac{1200}{P^2}$$

If $P = 1 \quad \frac{dq}{dp} = -1200$

and $E = \frac{dq}{dp} \cdot \frac{p}{q}$

$$E = -1200 \cdot \frac{1}{1200} = -1$$

If $P = 2$ $\frac{dq}{dp} = \frac{-1200}{4} = -300$

$$E = -300 \cdot \frac{2}{600} = -2$$

If $P = 3$ $\frac{dq}{dp} = \frac{-1200}{9} = \frac{-400}{3}$

$$E = \frac{-400}{3} \cdot \frac{3}{400} = -1$$

(b) Already solved in the previous example.

THE APPLICATION OF DERIVATIVES ON MARGINAL CONCEPT IN ECONOMICS

Marginal utility in economics is defined as the change in total utility by consuming one more unit next unit additional or last unit of commodity.

Marginal Cost is the change in total cost incurred from production of an additional unit or the cost incurred on producing one more or the last unit of output.

Marginal Revenue is the change in total Revenue brought about by the rate of an extra unit.

Marginal Propensity to consume is the change in consumption to change in income.

The concept of Marginal shows the rate of change in the total which is called the derivative. As slope also shows the rate of change so slope is found by taking the derivative of the function.

Utility function is written as

$$u = f(q)$$

Where 'u' is total utility and 'q' is quantity consumed. As M.u is the derivative of T.u. which is written as

$$M.u = \frac{dTu}{dq}$$

Marginal Propensity to consume is written as

$$MPC = \frac{dc}{dy}$$

Marginal Propensity to save is written as

$$MPS = \frac{ds}{dy}$$

Marginal Cost is written as

$$MC = \frac{dTC}{dq}$$

Marginal Revenue is written as

$$MR = \frac{dTR}{dq}$$

Model Question-9:

Given the following total utility functions:

(i) $u = 4Q - Q^2$

(ii) $u = 16Q - 4Q^2$

(iii) $u = 20Q - 20Q^2$

(a) Find M.u function in each case

(b) Show with the help of tables that the slope of Marginal utility is negative

Solution:

(i) (a) $u = 4Q - Q^2$

$$M.u = \frac{dT.u}{dq} = \frac{d}{dq}(4Q - Q^2)$$

$$M.u = 4 - 2Q$$

(ii) (a) $u = 16Q - 4Q^2$

$$M.u = \frac{dT.u}{dq} = \frac{d}{dq}(16Q - 4Q^2)$$

$$M.u = 16 - 8Q$$

(iii) (a) $u = 20Q - 20Q^2$

$$M.u = \frac{dT.u}{dq} = \frac{d}{dq}(20Q - 20Q^2)$$

$$M.u = 20 - 40Q$$

(b) The following are the tables to draw graphs of the above utility functions.

(i)

Q	1	2	3
M.u	2	0	−2

(ii)	Q	1	2	3
	M.u	8	0	-8
(iii)	Q	1	2	3
	M.u	–20	–60	–100

Model Question-10:

Given the following consumption functions:

(a) $C = 500 + 0.76y$

(b) $C = 650 - 2y^{1/2} + 0.8y$ at $y = 25, 100$

(c) $C = Co + cy - dy^2$

Where $y = 250, 500$ $d = 0.008$, $c = 0.8$, $Co = 50$

Find the marginal propensity to consume

Solution:

(a) $C = 500 + 0.76y$

$$MPC = \frac{dc}{dy} = \frac{d}{dy}(500 + 0.76y)$$

$$MPC = 0.76$$

(b) $C = 650 - 2y^{1/2} + 0.8y$ at $y = 25, 100$

$$MPC = \frac{dc}{dy} = \frac{d}{dy}(650 - 2y^{1/2} + 0.8y)$$

$$MPC = -y^{-1/2} + 0.8 \quad \text{or}$$

$$MPC = \frac{-1}{y^{1/2}} + 0.8$$

At $y = 25$ $MPC = \frac{-1}{(25)^{2}} + 0.8$

$$MPC = \frac{-1}{5} + 0.8 = -0.2 + 0.8$$

$$MPC = 0.6$$

At $y = 100$ $MPC = \frac{-1}{(100)^{2}} + 0.8$

$$MPC = -0.1 + 0.8 = 0.7$$

(c) $C = Co + cy - dy^2$

Putting the values of Co, c and d

$$C = 50 + 0.8y - 0.008y^2$$

$$MPC = \frac{dc}{dy} = \frac{d}{dy}(50 + 0.8y - 0.008y^2)$$

$$MPC = 0.8 - 0.016y$$

At $y = 250$ $MPC = 0.8 - 0.016(250)$

$$MPC = 0.8 - 0.4 = 0.4$$

At $y = 500$ $MPC = 0.8 - 0.016(500)$

$$MPC = 0.8 - 0.8 = \text{zero}$$

Model Question-11:

Given the following consumption function:

$$C = 150 + 0.8yd$$

And $yd = y - t$ and $T = 50$

Find marginal propensity to consume

Solution:

Put $yd = y - t$ $C = 150 + 0.8(y - t)$

Put $T = 50$ $C = 150 + 0.8y - 0.8(50)$

$$C = 150 + 0.8y - 40$$

$$C = 110 + 0.8y$$

$$MPC = \frac{dc}{dy} = \frac{d}{dy}(110 + 0.8y)$$

$$MPC = 0.8$$

Model Question-12:

Given the following saving function:

$$S = -20 + 0.2y$$

Find Marginal Propensity Save

Solution:

$$MPS = \frac{ds}{dy} = \frac{d}{dy}(-20 + 0.2y)$$

$$MPS = 0.2$$

Model Question-13:

Given the consumption function.

$$C = 500 + 0.8y$$

Find the MPC and APC

Solution:

(a) $C = 500 + 0.8y$

$$MPC = \frac{dc}{dy} = \frac{d}{dy}(500 + 0.8y)$$

$$MPC = 0.8$$

$$APC = \frac{c}{y} = \frac{500}{y} + \frac{0.8y}{y}$$

$$APC = \frac{500}{y} = 0.8$$

Model Question-14:

Given the saving function

$$S = -100 + 0.3y$$

Find the MPS and APs

Solution:

$$MPS = \frac{ds}{dy} = \frac{d}{dy}(-100 + 0.3y)$$

$$MPS = 0.3$$

$$APS = \frac{s}{y} = \frac{-100}{y} + \frac{0.3y}{y}$$

$$APS = \frac{-100}{y} + 0.3$$

Model Question-15:

Given the following consumption functions:

(a) $C = 500 + 0.76y$

(b) $C = 650 - 2y^{1/2} + 0.8y$ when $y = 25, 100$

(c) $C = Co + cy - dy^2$ when $y = 250, 500$

Where $Co = 50$, $c = 0.8$ and $d = 0.0008$

(i) Find MPC (ii) Find MPS

(iii) Find Multiplier in each case.

(a) (i) $C = 500 + 0.76y$

$$MPC = \frac{dc}{dy} = \frac{d}{dy}(500 + 0.76y)$$

$$MPC = 0.76$$

(ii) $MPS = 1 - MPC$

$MPS = 1 - 0.76 = 0.24$

(iii) $K = \frac{1}{MPs} = \frac{1}{0.24} = 4.16$

(b) (i) $C = 650 - 2y^{1/2} + 0.8y$

$MPC = \frac{dc}{dy} = \frac{d}{dy}(650 - 2y^{1/2} + 0.8y)$

$MPC = -y^{1/2} + 0.8$

or $MPC = \frac{-1}{y^{1/2}} + 0.8$

when $y = 25$ $MPC = \frac{-1}{(25)^{2}} + 0.8$

$MPC = -0.2 + 0.8 = 0.6$

(ii) $MPS = 1 - MPC$

$MPS = 1 - 0.6 = 0.4$

(iii) $K = \frac{1}{MPs} = \frac{1}{0.4} = 2.5$

when $y = 100$ $MPC = \frac{-1}{(100)^{2}} + 0.8$

(i) $MPC = -0.1 + 0.8 = 0.7$

$MPS = 1 - MPC$

$MPS = 1 - 0.7 = 0.3$

(iii) $K = \frac{1}{MPs} = \frac{1}{0.3} = 3.3$

(c) (i) $C = Co + cy + dy^2$

Where $Co = 50 + 0.8$ and $d = 0.0008$

$C = 50 + 0.8y - 0.0008y^2$

$MPC = \frac{dc}{dy} = \frac{d}{dy}(50 + 0.8y - 0.0008y^2)$

$MPC = 0.8 + 0.0016y$

When $y = 250$ $MPC = 0.8 - 0.0016(250)$

$MPC = 0.8 - 0.4 = 0.4$

(ii) $MPS = 1 - MPC$

$MPS = 1 - 0.4 = 0.6$

(iii) $K = \frac{1}{0.6} = 1.67$

(i) When $y = 500$ MPC $= 0.8 - 0.0016(500)$

$MPC = 0.8 - 0.8 = \text{zero}$

(ii) $MPS = 1 - MPC$

$MPS = 1 - 0 = 1$

(iii) $K = \frac{1}{MPS} = \frac{1}{1} = 1$

USE OF DERIVATIVES ON COST AND REVENUE

(Marginal Cost and Marginal Revenue)

Model Question-16:

Given the following total cost and total revenue functions. Find the marginal cost and marginal revenue functions.

(a) $TC = 2Q^2 + 10Q + 24$

(b) $TR = 100Q - 2Q$

Solution:

(a) $TC = 2Q^2 + 10Q + 24$

$$MC = \frac{dTc}{dq} = \frac{d}{dq}(2Q^2 + 10Q + 24)$$

$MC = 4Q + 10$

(b) $TR = 100Q - 2Q^2$

$$MR = \frac{dTR}{dq} = \frac{d}{dq}(100Q - 2Q^2)$$

$MR = 100 - 4Q$

Model Question-17:

Given the demand function

$P = 30 - 2Q$

Find the marginal revenue function.

Solution:

To find the MR function we have find the TR function and TR = P.Q. (Price × output)

$TR = P.Q$

$TR = (30 - 2Q)Q = 30Q - 2Q^2$

$$MR = \frac{dTR}{dq} = \frac{d}{dQ}(30Q - 2Q^2)$$

$$MR = 30 - 4Q$$

Model Question-18:

Given the total cost and total revenue function.

(a) $TC = 5Q^2 + 8Q + 20$

(b) $TR = 15Q - Q^2$

(i) Find Marginal and Average total cost functions

(ii) Find MC, ATC, MR and AR at $Q = 3, 7$

Solution:

(a) (i) $TC = 5Q^2 + 8Q + 20$

$$MC = \frac{dTC}{dq} = \frac{d}{dQ}(5Q^2 + 8Q + 20)$$

$$MC = 10Q + 8$$

$$ATC = \frac{TC}{Q} = \frac{5Q^2}{Q} + \frac{8Q}{Q} + \frac{20}{Q}$$

$$ATC = 5Q + 8 + \frac{20}{Q}$$

(ii) At $Q = 3$ $\quad MC = 10Q + 8$

$$MC = 10(3) + 8 = 38$$

At $Q = 3$ $\quad ATC = 5Q + 8 + \frac{20}{Q}$

$$ATC = 5(3) + 8 + \frac{20}{3} = 29.67$$

At $Q = 7$ $\quad MC = 10(7) + 8 = 78$

At $Q = 7$ $\quad ATC = 5(7) + 8 + \frac{20}{7} = 45.86$

(b) (i) $TR = 15Q - Q^2$

$$MR = \frac{dTR}{dQ} = \frac{d}{dQ}(15Q - Q^2)$$

$$MR = 15 - 2Q$$

$$AR = \frac{TR}{Q} = \frac{15Q}{Q} - \frac{Q^2}{Q}$$

$$AR = 15 - Q$$

At $Q = 3$ $MR = 15 - 2(3) = 9$

At $Q = 7$ $MR = 15 - 2(7) = 1$

At $Q = 3$ $AR = 15 - 3 = 12$

At $Q = 7$ $AR = 15 - 7 = 8$

Model Question-19:

Given the total cost function

$$C = 200 + 50Q - 4Q^2 + Q^3$$

(a) Find the marginal and average total cost functions.

(b) Find the slope of marginal cost function

Solution: (a) $C = 200 + 50Q - 4Q^2 + Q^3$

$$MC = \frac{dTC}{dQ} = \frac{d}{dQ}(200 + 50Q - 4Q^2 + Q^3)$$

$$MC = 50 - 8Q + 3Q^2$$

$$ATC = \frac{TC}{Q} = \frac{200}{Q} - \frac{50Q}{Q} - \frac{4Q^2}{Q} + \frac{Q^3}{Q}$$

$$ATC = \frac{200}{Q} - 50 - 4Q + Q^2$$

(b) Slope of $MC = \frac{dMC}{dQ} = \frac{d}{dQ}(50 - 8Q + 3Q^2)$

$$MC = -8 + 6Q$$

Model Question-20:

Given the total cost function of a firm

$$C = 1/3Q^3 - 10Q^2 + 50Q + 45$$

(a) Find Marginal cost function

(b) Find the slope of Marginal cost function

(c) Find the average variable cost function

(d) At what level of output Mc = Ave

Solution:

(a) $C = 1/3Q^3 - 10Q^2 + 50Q + 45$

$$MC = \frac{dTC}{dQ} = \frac{d}{dQ}(1/3Q^3 - 10Q^2 + 50Q + 45)$$

$$MC = Q^2 - 20Q + 50$$

(b) Slope of $MC = 2Q - 20$

(c) To find average variable cost, we have to find variable cost and variable cost is equal to total cost (–) fixed cost

$$VC = TC - FC$$
$$VC = 1/3Q^3 - 10Q^2 + 50Q + 45 - 45$$
$$VC = 1/3Q^3 - 10Q^2 + 50Q$$
$$AVC = \frac{VC}{Q} = 1/3Q^3 - 10Q + 50$$

(d) $Mc = AVC$

$$Q^2 - 20Q + 50 = 1/3Q^2 - 10Q + 50$$
$$Q^2 - 1/3Q^2 - 20Q + 10Q + 50 - 50 = 0$$
$$2/3Q^2 - 10Q = 0$$
$$Q(2/3Q - 10) = 0$$
$$Q = 0$$

And $2/3Q = 10$

$$Q = 10 \times \frac{3}{2} = 15$$

So MC is equal to AVC at Q = 0, 15

If $Q = 0$ $MC = Q^2 - 20Q + 50$

$$MC = 0 - 20(0) + 50 = 50$$

At $Q = 0$

$$AVC = 1/3Q^2 - 10Q + 50$$
$$AVC = 1/3(0) - 10(0) + 50 = 50$$

So at Q = 15 MC is also equal to AVC

Model Question-21:

Given the total cost function of a firm

$$C = 5000 + 1000Q - 40Q^2 + 2/3Q^3$$

(a) Find the marginal cost function

(b) Find the slope of marginal cost function

(c) Find the average variable cost function

(d) At what level of output Mc = Ave.

Solution:

(a) $C = 5000 + 1000Q - 40Q^2 + 2/3Q^3$

$$MC = 1000 - 80Q + 2Q^2$$

(b) Slope of MC $= \frac{dMC}{dQ} = \frac{d}{dQ}(1000 - 80Q + 2Q^2)$

Slope of MC $= -80 + 4Q$

(c) $AVC = \frac{VC}{Q}$

$VC = TC - FC$

$VC = 5000 + 1000Q - 40Q^2 + 2/3Q^2$

$AVC = \frac{1000Q}{Q} - \frac{40Q^2}{Q} + \frac{2/3Q^3}{Q}$

$AVC = 1000 - 40Q + 2/3Q^2$

(d) $MC = AVC$

$1000 - 80Q + 2Q^2 = 1000 - 40Q + 2/3Q^2$

$1000 - 80Q + 2Q^2 - 1000 + 40Q - 2/3Q^2 = 0$

$-40Q + 4/3Q^2 = 0$

$Q(-40 + 4/3Q) = 0$

$Q = 0$

And $4/3Q = 40$

$Q = 40 . \frac{3}{4} = 30$

If $q = 0$ $MC = 1000 - 80Q + 2Q^2$

$MC = 1000 - 80(0) + 2(0)$

$MC = 1000$

$AVC = 1000 - 40Q + 2/3Q^2$

$AVC = 1000 - 40(o) + 2/3(0)$

$AVC = 1000$

And so if $Q = 30$ $MC = AVC$

Model Question-22:

Given the total cost function of a firm

$C = 31 + 24Q - 5.5Q^2 + 1/3Q^3$

(a) Find the marginal cost function

(b) Find the slope of marginal cost function

(c) Find average variable cost function

(d) At what level of output $MC = AVC$

Solution:

(a) $C = 31 + 24Q - 5.5Q^2 + 1/3Q^3$

$$MC = \frac{dTC}{dQ} = \frac{d}{dQ}(31 + 24Q - 5.5Q^2 + 1/3Q^3)$$

$$MC = 24 - 11Q + Q^2$$

(b) $$\text{Slope of MC} = \frac{dMC}{dQ} = \frac{d}{dQ}(31+24Q - 5.5Q^2 + 1/3Q^3)$$

$$\text{Slope of MC} = -11 + 2Q$$

(c) $VC = TC - FC$

$$VC = 31 + 24Q - 5.5Q^2 + 1/3Q^3 - 31$$

$$VC = 24Q - 5.5Q^2 + 1/3Q^3$$

$$AVC = \frac{VC}{Q} = \frac{24Q}{Q} - \frac{5.5Q^2}{Q} + \frac{1/3Q^3}{Q}$$

$$AVC = 24 - 5.5Q + 1/3Q^2$$

(d) $MC = AVC$

$$24 - 11Q + Q^2 = 24 - 5.5Q + 1/3Q^2$$

$$24 - 11Q + Q^2 - 24 + 5.5Q - 1/3Q^2 = 0$$

$$-5.5Q + 2/3Q^2 = 0$$

$$Q(-5.5 + 2/3Q) = 0$$

$$Q = 0$$

And $2/3Q = 5.5$

$$Q = 5.5 \times \frac{3}{2} = 8.25$$

At $Q = 8.25$ $MC = 24 - 11Q + Q^2$

$$MC = 24 - 11(8.25) + (8.25)^2$$

$$MC = 24 - 90.75 + 68.06 = 1.3125$$

$$AVC = 24 - 5.5Q + 1/3Q^2$$

$$AVC = 24 - 5.5(8.25) + 1/3(8.25)^2$$

$$AVC = 24 - 45.375 + 22.6875 = 1.3125$$

Model Question-23:

Given the following demand and supply function:

(a) $P = Q^2 + 2Q + 1$

(b) $Q + 60 - 5P = 0$

(c) $44 - 4P - 4Q = 0$

(i) Find total and marginal revenue function

(ii) Find slope of MR where possible

(iii) Find marginal revenue at Q = 5, 25

Solution:

(a) (i) $P = Q^2 + 2Q + 1$

$TR = P.Q$

$TR = (Q^2 + 2Q + 1)Q = Q^3 + 2Q^2 + Q$

$$MR = \frac{dTR}{dQ} = \frac{d}{dQ}(Q^3 + 2Q^2 + Q)$$

$MR = 3Q^2 + 4Q + 1$

(ii) $$\text{Slope of MR} = \frac{dMR}{dQ} = \frac{d}{dQ}(3Q^2 + 4Q + 1)$$

Slope of MR $= 6Q + 4$

(iii) If $Q = 2$ $MR = 3Q^2 + 4Q + 1$

$MR = 3(2)^2 + 4(2) + 1 = 21$

If $Q = 5$ $MR = 3(5)^2 + 4(5) + 1 = 96$

(b) (i) $Q + 60 - 5P = 0$

Bringing the demand function in the standard form

$5P = Q + 60$

$$P = \frac{Q}{5} + 12$$

$TR = P.Q$

$TR = (1/5Q + 12)\,Q = 1/5Q^2 + 12Q$

$$MR = \frac{dTR}{dQ} = \frac{d}{dQ}(1/5Q^2 + 12Q)$$

$$MR = \frac{2}{5}Q + 12$$

(ii) $$\text{Slope of MR} = \frac{dMR}{dQ} = \frac{d}{dQ}(\frac{2}{5}Q + 12)$$

$$\text{Slope of MR} = \frac{2}{5}$$

(iii) If $Q = 2 \quad MR = \frac{2}{5} \times 2 + 12 = 12.8$

If $Q = 5 \quad MR = \frac{2}{5} \times 5 + 12 = 14$

(c) (i) $44 - 4P - Q = 0$

or $4P = 44 - Q$

$$P = 44 - \frac{1}{4}Q$$

$$TR = P.Q$$

$$TR = (11 - \frac{1}{4}Q)Q = 11Q - \frac{1}{4}Q^2$$

$$MR = \frac{dTR}{dQ} = \frac{d}{dQ}(11Q - \frac{1}{4}Q^2)$$

$$MR = 11 - \frac{1}{2}Q$$

(ii) Slope of MR = $\frac{dMR}{dQ} = \frac{d}{dQ}(11 - \frac{1}{2}Q)$

Slope of MR = $-\frac{1}{2}$

(iii) If $Q = 2 \quad MR = 11 - \frac{1}{2}(2) = 10$

If $Q = 5 \quad MR = 11 - \frac{1}{2}(5) = 8.5$

Model Question-24:

Given the following average cost functions:

(a) $AC = 1.5Q + 4 + \frac{46}{Q}$

(b) $AC = \frac{160}{Q} + 5 - 3Q + 2Q^2$

(c) $AC = \frac{18}{Q} + 0.1 + 0.5Q^2$

(i) Find marginal cost functions in each case

(ii) Find the slope of marginal cost functions in each case.

Solution:

(a) (i) To find Marginal cost we have to find total cost, which is = average cost x output

$$AC = 1.5Q + 4 + \frac{46}{Q}$$

$$TC = AC \, . \, Q$$

$$TC = (1.5Q + 4 + \frac{46}{Q})Q$$

$$TC = 1.5Q^2 + 4Q + 46$$

$$MC = \frac{dTC}{dQ} = \frac{d}{dq}(1.5Q^2 + 4Q + 46)$$

$$MC = 3Q + 4$$

(ii) $\text{Slope of MC} = \frac{dMC}{dQ} = \frac{d}{dQ}(3Q + 4)$

$\text{Slope of MC} = 3$

(b) (i) $AC = \frac{160}{Q} + 5 - 3Q + 2Q^2$

$$TC = AC \times Q$$

$$TC = (\frac{160}{Q} + 5Q - 3Q + 2Q^2)Q$$

$$TC = 160 + 5Q - 3Q^2 + 2Q^3$$

$$MC = \frac{dTC}{dQ} = \frac{d}{dQ}(160 + 5Q - 3Q^2 + 2Q^3)$$

$$MC = 5 - 6Q + 6Q^2$$

(ii) $\text{Slope of MC} = \frac{dMC}{dQ} = \frac{d}{dQ}(5 - 6Q + 6Q^2)$

$\text{Slope of MC} = -6 + 12Q$

(c) (i) $AC = \frac{18}{Q} + 0.1 + 0.5Q$

$$TC = AC \times Q$$

$$TC = (\frac{18}{Q} + 0.1 + 0.5Q)Q$$

$$TC = 18 + 0.1Q + 0.5Q^2$$

$$MC = \frac{dTC}{dQ} = \frac{d}{dQ}(18 + 0.1Q + 0.5Q^2)$$

$$MC = 0.1 + Q$$

(ii) $$\text{Slope of MC} = \frac{dMC}{dQ} = \frac{d}{dQ}(0.1 + Q)$$

$$\text{Slope of MC} = 1$$

Model Question-25:

Given the following total cost functions of a firm:

I. $C = 1000 + 25Q - 5Q^2 + Q^3$

II. $C = \frac{1}{8Q^2} + 2Q + 10$

III. $C = Q^3 - 2Q^2 + 9Q + 650$

(a) Find the marginal and average cost functions

Solution:

I (a) $C = \frac{1}{8}q^2 + 2q + 10$

$$MC = \frac{dTC}{dQ} = \frac{d}{dQ}(1/8q^2 + 2q + 10)$$

$$MC = \frac{1}{4}q + 2$$

$$AC = \frac{TC}{q} = \frac{1/8q^2}{q} + \frac{2q}{q} + \frac{10}{q}$$

$$AC = \frac{1}{8}q + 2 + \frac{10}{q}$$

II (a) $C = q^3 - 2q^2 + 9q + 650$

$$MC = \frac{dTC}{dq} = \frac{d}{dq}(q^3 - 2q^2 + 9q + 650)$$

$$MC = 3q^2 - 4q + 9$$

$$AC = \frac{TC}{q} = \frac{q^3}{q} - \frac{2q^2}{q} + \frac{9q}{q} + \frac{650}{q}$$

$$AC = q^2 - 2q + 9 + \frac{650}{q}$$

Model Question-26:

Given the following demand functions

I. $q = 20 - 2P$ II. $q = 18 - P$

(a) Find the total Revenue functions

(b) Find the Marginal Revenue functions

(c) What relationship exist between the slope of marginal revenue and average revenue

I. (a) $q = 20 - 2P$

Bringing the function into P = f(q) form to find the total Revenue.

$$2P = 20 - q$$
$$P = 10 - 0.5q$$
$$TR = P.Q$$
$$TR = (10 - 0.5q)q$$
$$TR = 10q - 0.5q^2$$

(b) $$MR = \frac{dTR}{dq} = \frac{d}{dq}(10q - 0.5q^2)$$
$$MR = 10 - q$$

(c) $$\text{Slope of MR} = \frac{dMR}{dq} = \frac{d}{dq}(10 - q)$$
$$\text{Slope of MR} = -1$$
$$\text{Slope of AR} = \frac{dAR}{dq} = \frac{d}{dq}(10 - 0.5q)$$
$$\text{Slope of AR} = -0.5$$

Therefore Slope of MR is double the Slope of AR

II.(a) $q = 18 - P$

Bringing the demand function into P = f(q) form to find out total revenue.

$$P = 18 - q$$
$$TR = P.Q$$
$$TR = (18 - q)q$$
$$TR = 18q - q^2$$

(b) $$MR = \frac{dTR}{dq} = \frac{d}{dq}(18q - q^2)$$
$$MR = 18 - 2q$$

(c) $$\text{Slope of AR} = \frac{dAR}{dq} = \frac{d}{dq}(18 - q)$$
$$\text{Slope of AR} = -1$$

Therefore the Slope of MR is double the Slope of AR

Put Q = 2 to find MC and AC

$$MC = 9(2) - 24(2)$$
$$MC = 36 - 48 + 30 = 18$$
$$AC = 3q^2 - 12q + 30$$
$$AC = 3(2) - 12(2)$$
$$AC = 12 - 24 + 30$$
$$AC = 12 - 24 + 30 = 18$$

So at q = 2 MC = AC

Model Question-30:

Given the following total revenue, total cost, and total profit functions

(a) $TR = 30q - q^2$

(b) $TC = \frac{1}{3} q^3 - 4.5q^2 + 14q + 2$

(c) $\pi = -q^2 + 11q - 24$

Solution:

Find maximum level of output where

Total revenue is maximum, total cost is minimum and total profit are maximum.

(a) $TR = 30q - q^2$

First order condition of maxima is $\frac{dTR}{dq} = 0$

$$\frac{dTR}{dq} = \frac{d}{dq}(30q - q^2)$$
$$\frac{dTR}{dq} = 30 - 2q = 0$$
$$2q = 30$$
$$q = 15$$

Second order condition of maxima is $\frac{d^2TR}{dq^2} < 0$

$$\frac{d^2TR}{dq^2} = \frac{d}{dq}(30 - 2q)$$
$$\frac{d^2TR}{dq^2} = -2$$

As the second derivative is negative so total revenue is maxima t q = 15.

(b) $TC = \frac{1}{3}q^3 - 4.5q^2 + 14q + 22$

First order condition of minima is $\frac{dTC}{dq} = 0$

$$\frac{dTC}{dq} = \frac{d}{dq}\left(\frac{1}{3}q^3 - 4.5q^2 + 14q + 22\right)$$

$$\frac{dTC}{dq}(q^2 - 9q + 14) = 0$$

We find the value of q by factorizing the above

$$q^2 - 7q - 2q + 14 = 0$$

$$q(q-7) - 2(q-7) = 0$$

$$q = 2, 7$$

Second order derivative condition is $\frac{d^2TC}{dq^2} > 0.$

$$\frac{d^2TC}{dq^2} = \frac{d}{dq}(q^2 - 9q + 14)$$

$$\frac{d^2TC}{dq^2} = 2q - 9$$

At $q = 2$ $\frac{d^2TC}{dq^2} = (2q - 9)$

$$\frac{d^2TC}{dq^2} = 2(2) - 9 = -5$$

As the second order derivative is negative so total cost is not minimum at $q = 2$.

At $q = 7$ $\frac{d^2TC}{dq^2} = 2q - q$

$$\frac{d^2TC}{dq^2} = 2(7) - 9 = 5$$

As the second derivative is positive so total cost is minimum at $q = 7$.

(c) $\pi = -q^2 + 11q - 24$

First order condition of maxima is $\frac{d\pi}{dq} = 0$

$$\frac{d\pi}{dq} = \frac{d}{dq}(-q^2 + 11q - 24)$$

$$\frac{d\pi}{dq} = -2q + 11$$

$$2q = 11$$
$$q = 5.5$$

Second order condition of maxima is $\frac{d\pi}{dq^2} < 0$

$$\frac{d^2\pi}{dq^2} = (-2q + 11)$$
$$\frac{d^2\pi}{dq^2} = dq = -2$$

As the second derivative is negative so profit are maximum at $q = 5.5$.

Model Question-31:

Given the demand function of a monopoly:

(i) Find total revenue and marginal revenue functions.

(ii) What relationship exists between the slopes of MR and AR.

(iii) A what level of output and price the MR of this firm is zero.

Solution:

(i) $P = 200 - 2q$

$$TR = p.q$$
$$TR = (200 - 2q)\,q$$
$$TR = 200\,q - 2q^2$$
$$MR = \frac{dTR}{dq} = \frac{d}{dq}(200q - 2q^2)$$
$$MR = 200 - 4q$$

(ii) Slope of AR $= \frac{dP}{dq} = \frac{d}{dq}(200 - 2\,q)$ (P = AR)

Slope of AR $= -2$

Slope of MR $= \frac{dMR}{dq} = \frac{d}{dq}(200 - 4q)$

Slope of MR $= -4$

The slope of MR is double the slope of AR

(iii) $MR = 200 - 4q = 0$

$$4q = 200$$
$$q = 50$$
$$P = 200 - 2q$$
$$P = 200 - 2(50) = 100$$

which mean that at $q = 50$ and $P = 100$, the MR of this firm is zero.

Model Question-32:

Given the following total revenue function:

$$TR = 50q - 2q^2$$

(i) Find the average and marginal revenue functions.

(ii) Show that when MR = 0, TR is at a maximum point (iii) when MR < AR, AR is decreasing (iv), when MR = AR, AR is unchanged.

Solution: (i) $TR = 50q - 2q^2$

$$AR = \frac{TR}{q} = \frac{50q}{q} - \frac{2q^2}{q}$$

$$AR = 50 - 2q$$

$$MR = \frac{dTR}{dq} = \frac{d}{dq}(50q - 2q^2)$$

$$MR = 50 - 4q$$

(ii) When MR = 0

$$50 - 4q = 0$$

$$4q = 50$$

$$q = 12.5$$

Second order condition of maxima is

$$\frac{d^2TR}{dq^2} = \frac{d}{dq}(50 - 4q)$$

$$\frac{d^2TR}{dq^2} = -4$$

As the second derivative is negative so TR is maximum when MR = 0.

(iii) Slope of AR $= \frac{dAR}{dq} = \frac{d}{dq}(50 - 2q)$

Slope of AR = – 2

Suppose q = 2 then MR = 50 – 4q

$$MR = 50 - 4(2) = 42$$

$$AR = 50 - 2q$$

$$AR = 50 - 2(2) = 46$$

So when MR is less than AR, AR is decreasing.

(iv) If MR = AR then AR in case of perfect competition does not change.

Model Question-33:

Given the following total revenue functions:

(a) $TR = 24q - 3q^2$ (b) $TR = 120q - 4q^2$

(i) Find the Average and Marginal Revenue functions

(ii) Show that when MR = 0, TR is at maximum point, when MR < AR, AR is decreasing, when MR = AR, AR is unchanged in case of perfect competition.

Solution: (a) (i)

$$TR = 24q - 3q^2$$

$$AR = \frac{TR}{q} = \frac{34q}{q} - \frac{3q^2}{q}$$

$$AR = 24 - 3q$$

$$MR = \frac{dTR}{dq} = \frac{d}{dq}(24q - 3q^2)$$

$$MR = 24 - 6q$$

(ii) When MR = 0

$$24 - 6q = 0$$

$$6q = 24$$

$$q = 4$$

For relative maximum

$$\frac{d^2TR}{dq^2} = \frac{d}{dq}(24 - 6q)$$

$$\frac{d^2TR}{dq^2} = -6$$

As the second derivative is negative so TR is maximum when MR = 0.

When MR = AR

For this we find the slope of AR

$$\text{Slope of AR} = \frac{dAR}{dq} = \frac{d}{dq}(24 - 3q)$$

Slope of AR = -3 i.e., AR is decreasing

If Q = 3, $AR = 24 - 3(3) = 15$

$MR = 24 - 6(3) = 6$

Therefore, when AR is decreasing MR < AR.

When MR = AR

$$24 - 6q = 24 - 3q$$

$$-6q + 3q = 24 - 24 \quad \text{i.e.,} \quad -3q = 0$$

Therefore $q = 0$.

Hence, at $q = 0$, MR = AR in the function AR is decreasing.

(Only in perfect compeletion, MR = AR)

$\therefore$ It is not a perfectly compeletive market.

(b) (i) $TR = 120\,q - 4q^2$

$$AR = \frac{TR}{q} = \frac{120\,q}{q} - \frac{4q^2}{q}$$

$$AR = 120 - 4q$$

$$\frac{dTR}{q} = \frac{d}{dq}(120\,q - 4q^2)$$

$$MR = 120 - 8q$$

(ii) When MR = 0

$$120 - 8q = 0$$

$$8q = 120$$

$$q = 15$$

For relative maximum

$$\frac{d^2TR}{dq^2} = \frac{d}{dq}(120 - 8q)$$

$$\frac{d^2TR}{dq^2} = -8$$

As the second derivative is negative so TR is maximum when MR = 0.

When MR < AR

We find the slope of AR

$$\text{Slope of AR} = \frac{dAR}{dq} = \frac{d}{dq}(120 - 4q)$$

$$\text{Slope} = \frac{dAR}{dq} = -4 \quad \text{i.e., AR is decreasing}$$

If $Q = 4$ $\quad MR = 120 - 4(4) = 104$

$$MR = 120 - 8(4) = 88$$

Therefore, when AR is decreasing MR < AR.

When MR = AR

$$120 - 8q = 120 - 4q$$

$$-4q = 0$$

$$q = 0$$

So at q = 0 MR = AR, but in the above function MR and AR are decreasing. So only in perfect completion MR = AR.

Model Question-34:

Given the following total cost functions:

(a) $TC = 2q^3 - 20q^2 + 100\,q$

(b) $TC = q^3 - 60q^2 + 1800\,q$

(i) Find the Marginal cost and average cost functions.

(ii) At what level of output average cost is minimum.

(iii) At what level of output MC = AC.

Solution:

(a)(i)

$$TC = 2q^3 - 20\,q^2 + 100\,q$$

$$MC = \frac{dTC}{dq} = \frac{d}{dq}(2q^3 - 20q^2 + 100\,q)$$

$$MC = 6q^2 - 40q + 100$$

$$AC = \frac{TC}{q} = \frac{2q^3}{q} - \frac{40q^2}{q} - \frac{100\,q}{q}$$

$$AC = 2q^2 - 20q + 100$$

(ii) First order condition for relative minimum

$$\frac{dAC}{dq} = 0$$

$$\frac{dAC}{dq} = \frac{d}{dq}(2q^2 - 20q + 100)$$

$$\frac{dAC}{dq} = 4q - 20$$

$$4q - 20 = 0$$

$$4q = 20$$

$$q = 5$$

Second order condition for relative maximum

$$\frac{d^2AC}{dq^2} = \frac{d}{dq}(4q - 20)$$

$$\frac{d^2AC}{dq^2} = 4$$

As the second derivative is positive so AC is minimum at q = 5.

(iii) At q = 5

$$MC = 6q^2 - 40q + 100$$

$$MC = 6(5)^2 - 40(5) + 100$$

$$MC = 150 - 200 + 100 = 50$$

$$AC = 2q^2 - 20q + 100$$

$$AC = 2(5)^2 - 20(5) + 100$$

$$AC = 50 - 100 + 100 = 50$$

MC = AC at q = 5 and at q = 5 AC is minimum so it is proved that when AC is Minimum MC = AC.

(b)(i) $TC = q^3 - 60q^2 + 1800\,q$

$$MC = \frac{dTC}{dq} = \frac{d}{dq}(q^3 - 60q^2 + 1800\,q)$$

$$MC = 3q^2 - 120\,q + 1800$$

$$AC = \frac{TC}{q} = \frac{q^3}{q} - \frac{60}{q} + \frac{1800\,q}{q}$$

$$AC = q^2 - 60q + 1800$$

(ii) For relative minimum

$$\frac{dAC}{dq} = \frac{d}{dq}(q^2 - 60q + 1800)$$

$$\frac{dAC}{dq} = 2q - 60$$

$$2q - 60 = 0$$

$$2q = 60$$

$$q = 30$$

Second order condition of relative minimum

$$\frac{d^2AC}{dq^2} = \frac{d}{dq}(2q - 60)$$

$$\frac{d^2AC}{dq^2} = 2$$

As the second derivative is positive so AC is minimum at q = 30.

(iv) At q = 30

$$AC = q^2 - 60 + 1800$$
$$AC = (30)^2 - 60(30) + 1800$$
$$AC = 900 - 1800 + 1800 = 900$$
$$MC = 3q^2 - 120q + 1800$$
$$MC = 3(30)^2 - 120(30) + 1800$$
$$\text{or} \quad MC = 2700 - 3600 + 1800 = 900$$

Therefore, MC = AC at q = 30 and at q = 30

AC is minimum i.e., when AC is minimum MC = AC.

In this chapter we have studied the concept of costs and revenue separately.

To find out the profits of a firm we subtract total costs from total revenue and for maximum profits we fulfill the condition of relative maximum.

Some times Govt. imposes tax e.g., sales tax, excise duty or any other tax, which decreases the profit of the firm and some times Govt. gives subsidy. After the imposition of tax, a firm can increase the price of his product but some times it is difficult to shift the whole of the tax to consumers. In this case firm increases price upto some extent and decreases output. It will be explained in the next model questions.

Model Question-35:

Gives the total cost and total revenue functions of a firm:

$$TC = q^3 - 9q^2 + 30q + 10$$
$$TR = 70\,q - 8q^2$$

(i) Find the marginal cost and marginal revenue functions.

(ii) At what level of output the profits are maximum.

(iii) Prove that when MC = MR, the profits are really maximum.

Solution: (i)

$$MC = \frac{dTC}{dq} = \frac{d}{dq}(q^3 - 9q^2 + 30q + 10)$$
$$MC = 3q^2 - 18q + 30$$
$$MR = \frac{dTR}{dq} = \frac{d}{dq}(70\,q - 8q^2)$$
$$MR = 70 - 6q$$

(ii) Total profit = Total Revenue – Total cost

We shall denote total profits by a symbol π, here is $\pi = TR - TC$.

$$\pi = 70q - 8q^2 - (q^3 - 9q^2 + 30q + 10)$$

$$\pi = 70q - 8q^2 - q^3 + 9q^2 - 30q - 10$$

$$\pi = -q^3 + q^2 + 40q - 10$$

First order condition of relative maximum

$$\frac{d\pi}{dq} = \frac{d}{dq}(-q^3 + q^2 + 40q - 10)$$

$$\frac{d\pi}{dq} = -3q^2 + 2q + 40 = 0$$

Solving the above quadratic equation with the help of a formula

$$q = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

where $a = -3$, $b = 2$, and $c = 40$

$$q = \frac{-2 \pm \sqrt{(2)^2 - (4x - 3 \times 40)}}{2(-3)}$$

$$q = \frac{-2 \pm \sqrt{4 + 480}}{-6}$$

$$q = \frac{-2 \pm \sqrt{484}}{-6}$$

$$q = \frac{-2 + 22}{-6} = \frac{20}{-6} = -3\frac{1}{3}$$

or $$q = \frac{-2 - 22}{-6} = \frac{-24}{-6} = 4$$

As quantity is may never a negative so q is 4

Second order condition of maxima

$$\frac{d^2\pi}{dq^2} = \frac{d}{dq}(-3q^2 + 2q + 40)$$

$$\frac{d^2\pi}{dq^2} = -6q + 2$$

Put $q = 4$ $$\frac{d^2\pi}{dq^2} = -6(4) + 2 = -22$$

As the second derivative is negative so profits are maximum at $q = 4$.

(iii) At $q = 4$

$$MC = 3q^2 - 10q + 30$$

$$MC = 3(4)^2 - 18(4) + 30$$

$$MC = 48 - 72 + 30 = 6$$

$$MC = 70 - 16q$$

$$MC = 70 - 16(4) = 6$$

So MC = MR at q = 4 and at q = 4 the profits are maximum. Hence, it is proved the when MC = MR, profits are really maximum.

Model Question-35:

If perfect competition exists find maximum TR, Minimum TC, and maximum total profits given the price and average cost below:

(a) $P = 10 \quad AC = q^2 + \frac{3}{2q^2} - 80 + \frac{9}{q}$

(b) $P = 15 \quad AC = \frac{1}{3}q^2 - 2q - 50 + \frac{9}{q}$

(c) $P = 2 \quad AC = \frac{q^2}{3} + \frac{1}{2}q - 4 + \frac{10}{3q}$

Solution:

(a) $P = 10 \quad AC = q^2 + \frac{3}{2q^2} - 80 + \frac{9}{q}$

$$TR = p.q$$

$$TR = 10.q = 10q$$

First order condition of relative maximum $\frac{dTR}{dq} = 0$

$$\frac{dTR}{dq} = \frac{d}{dq}(10\,q)$$

$$\frac{dTR}{dq} = 10$$

Second derivative order condition of maximum is $\frac{d^2TR}{dq} < 0$

$$\frac{d^2TR}{dq} = \frac{d}{dq}(10) = \text{zero}$$

As the second derivative is zero so there is no point of maximum.

$$AC = q^2 + \frac{3}{2}q - 8 + \frac{9}{q}$$

$$TC = AC\,.\,q$$

$$TC = \left(q^2 + \frac{3}{2}q - 8 + \frac{9}{q}\right)$$

First order condition of minima is $\frac{TC}{dq} = 0$

$$\frac{dTC}{dq} = \frac{d}{dq}\left(q^3 + \frac{3}{2}q^2 - 8q + 9\right)$$

$$\frac{dTC}{dq} = 3q^2 + 3q - 8$$

$$3q^2 + 3q - 8 = 0$$

We can find the value of q by solving the above equation with the help of formulate because factorization is not possible.

$$q = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

where a = 3, b = 3 and c = − 8

$$q = \frac{-3 \pm \sqrt{(3)^2 - (4 \times 3 \times -8)}}{2(3)}$$

$$q = \frac{-3 \pm \sqrt{9 + 96 + 1}}{6} = \frac{-3 \pm \sqrt{105}}{6}$$

$$q = \frac{-3 \pm 10.25}{6} = \frac{-3 - 10.25}{6} = \frac{7.25}{6} = 1.21$$

or $$q = \frac{-3 - 10.25}{6} = \frac{-13.25}{6} = -2.21$$

As quantity is never negative so q = 1.21.

The second order condition of minima $\frac{d^2TC}{dq^2} > 0$

$$\frac{d^2TC}{dq^2} = \frac{d}{dq}(3q^2 + 3q - 8)$$

$$\frac{d^2TC}{dq^2} = 6q + 3$$

Put q = 1.21 $\frac{d^2TC}{dq^2} = 6(1.21) + 3 = 10.26$

As second derivative is positive, so cost is minimum at q = 1.21.

$$\pi = TR - TC$$

$$\pi = 10q - \left(q^3 + \frac{3}{2}q^2 - 8q + 9\right)$$

$$\pi = -q^3 - \frac{3}{2}q^2 + 18q - 9$$

A/2005 B.COM-I
NEW COURSE

B. Com. Part-I
Paper: BC-303 (Economics)

Time Allowed: 3 Hours
Max. Marks: 100

Note: ***Attempt any FIVE questions including Question No. 9 which is compulsory. All questions carry equal marks.***

1. Critically examine Robbins definition of Economics. (20)

2. Explain the law of diminishing marginal utility with the help of schedule and diagram. (20)

3. What is elasticity of demand? How is it measured? (20)

4. Explain with the help of schedule and diagram the law of diminishing return. (20)

5. How is price and output determine under monopolistic competition? (20)

6. Critically examine the Ricardian Theory of Rent. (20)

7. Explain the different methods of measurement of National Income. Point out the difficulties in its correct measurement. (20)

8. If $C = 200 + 50Q - 4Q^2 + Q^3$ (20)

   (i) Find the marginal cost function

   (ii) Find the slope of marginal cost function

9. Write short notes on the following: (Compulsory) (20)

   (i) Consumer surplus

   (ii) Direct and indirect taxes

   (iii) Fiscal policy

   (iv) Four cannons of taxation

   (v) Impact of zakat on production

A/2006 B.COM-I
NEW COURSE

B. Com. Part-I **Time Allowed: 3 Hours**
Paper: BC-303 (Economics) **Max. Marks: 100**

Note: ***Attempt any FIVE questions including Question No. 9 which is compulsory. All questions carry equal marks.***

1. Write short answers for the following (Compulsory Question): (20)
   - (i) Define Marginal Rate of Substitution (MRS).
   - (ii) What is Budget Line?
   - (iii) Write down the formula of Income Ed.
   - (iv) Define Equilibrium Price.
   - (v) Define Variable of Prime Cost.
   - (vi) What is the Prime Discrimination?
   - (vii) Define Monopolistic Competition.
   - (viii) How did Ricardo define Rent?
   - (ix) Define Net National Product (N.N.P).
   - (x) Define Progressive Tax.
2. State and explain the law of Equi-MU with the help of a schedule and diagram. (20)
3. State explain and prove the main properties of indifference curves. (20)
4. Define elasticity of demand. Explain various methods to measure elasticity of demand. (5,15)
5. State and explain the law of variable proportions with the help of a schedule and diagram. (20)
6. Define monopoly. Explain how price and output is determined under monopoly in the short and long run. (5,15)
7. "Interest is the reward for parting liquidity". Discuss and explain. (20)
8. Define national income. Explain various methods of measurement of national income. (5,15)
9. Given the total cost function of a firm: (4,4,4,8)

$$C = \frac{1}{3}Q^3 - 10Q^2 + 50Q + 45$$

   - (i) Find marginal cost function.
   - (ii) Find the slope of marginal cost function.
   - (iii) Find average variable cost function.
   - (iv) At what level of output MC = AVC.

A/2007 B.COM-I
NEW COURSE

B. Com. Part-I
Paper: BC-303 (Economics)

Time Allowed: 3 Hours
Max. Marks: 100

Note: *Attempt any FIVE questions including Question No. 1 which is compulsory. All questions carry equal marks.*

1. Write short answers for the following (Compulsory Question): (20)
   - (i) Define Marginal Rate of Substitution (MRS).
   - (ii) Why an Indifference Curve is convex to the origin?
   - (iii) Define Point Elasticity of Demand.
   - (iv) What is Floor Price?
   - (v) Write down the formula of Arc Elasticity of Demand.
   - (vi) Define Kinked demand curve.
   - (vii) Define Liquidity Preference.
   - (viii) Define Gross National Product (GNP).
   - (ix) Define progressive tax.
   - (x) Define a derivative.
2. State and explain the Law of Diminishing Marginal Utility with the help of a schedule and diagram. (20)
3. Define an Indifference curve. Show and explain how a consumer reaches equilibrium with the help of Indifference Curves. (20)
4. Define Income and Cross Elasticity of Demand. Explain their measurement with the help of mathematical examples. (10,10)
5. Distinguish between Fixed Cost and Variable Cost. Explain the Family of Cost with the help of Schedule and diagrams. (5,15)
6. Define Monopolistic Competition. Explain short and long run equilibrium of a firm under Monopolistic Competition. (5,15)
7. Critically examine Ricardian Theory of Rent. (20)
8. Discuss various Canons or Principles of Taxes. (20)
9. Given the following total cost function. (5,5,5,5)

   $$TC = 35 + 5Q - 2Q^3 + 2Q^2$$

   Find: (i) MC function.
   - (ii) Average Total Cost (ATC)
   - (iii) Average Variable Cost (AVC)
   - (iv) Value of MC. ATC and AVC when $Q = 5$.

Recommended Syllabus Books For B.Com Part-I

1- Accounting an intuitive approach (Sohail Afzal, M.Arif)
2- Solution to Accounting (Sohail Afzal, M.Arif)
3- Money Banking & Finance (Riaz Ahmed Mian)
4- Economics (Sohail Akhtar Muhammad Rafique Tahir)
5- Modern Business Statistics & Mathematics (Nadeem Akhtar Siddique, Tariq Ali Khan)
6- Introduction to Business (Qazi Shahzad Ehtesham)
7- Computer Application (Mazhar Iqbal)
8- Functional English (Shakeel Amjad, Imran Hashmi)
9- عظیم اسلامیات (زرینہ یعقوب ڈاکٹر رفاقت علی اکبر)

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